

**BIOLOGICAL EVALUATION  
for  
BIRDS, MAMMALS, and INSECTS**

***California Integrated Weed Management Project***

Humboldt-Toiyabe National Forest  
Carson Ranger District  
FY2018

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National Forest

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## **I. INTRODUCTION**

This Biological Evaluation (BE) has been prepared to evaluate potential effects of the California Integrated Weed Management Project on animals listed as sensitive by the United States Forest Service Region 4 Regional Forester (USDA 2011). The BE specifically addresses whether the project may result in a loss of viability of Forest sensitive species, or cause a sensitive species to trend toward federal listing. This document was prepared in accordance with Forest Service Manual direction 2672.42 and meets legal requirements set forth under Section 7 of the Endangered Species Act of 1973, as amended and implementing regulations (19 U.S.C. 1536 (c), 50CFR 402.12 (f) and 402.12 (c). A Biological Assessment (BA) was also prepared to analyze the potential effects to Threatened, Endangered, and Proposed species with potential to occur within the project area. The BA is included in the project record.

## **II. PROJECT DESCRIPTION**

### **Purpose and Need**

The purpose of this project is to implement an Integrated Weed Management approach to prevent, eradicate and/ or control infestations of invasive plants on the Humboldt-Toiyabe National Forest that occur in California, using manual, mechanical, biological, and chemical control measures. Treatments would involve integrated prescriptions that generally combine the use of multiple types of methods over several years. The purpose is also to establish criteria, under which an Early Detection Rapid Response (EDRR) approach would be implemented, thereby allowing for rapid treatment of newly discovered target invasive plants. Non-native invasive species have prolific seeding rates that quickly colonize in disturbed settings. Wildfire events, in particular, can pose the highest risk for weed spread with bare ground, high nutrient availability and a lack of competing plants. Displacement of native plant communities by invasive plants can have negative impacts on fire regimes, wildlife habitats, recreation opportunities, forage production, and scenic beauty. The CIWMP will include a monitoring plan that outlines a strategy for monitoring both treatment effectiveness and the effectiveness of project design features.

### **Background**

The Humboldt-Toiyabe National Forest spans the entire state of Nevada and portions of California. In 2001 a programmatic Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) was completed to implement an Integrated Pest Management Program for the Toiyabe-Nevada portion of the Humboldt-Toiyabe National Forest. The EA addressed the use of multiple methods for treating invasive plant species including prevention, mechanical, manual (hand-pulling), chemical, and biological controls. While this document provides a thorough strategy for controlling weeds on National Forest System (NFS) Lands in Nevada, NFS lands in California were not included in the analysis.

The terms “Noxious Weeds” and “Invasive Species” are used interchangeably throughout this document to describe terrestrial, non-native plant species that pose a threat to native plant communities. More specifically:

“Invasive” plants are defined in Executive Order 13112 as “non-native plants whose introduction does or is likely to cause economic or environmental harm or harm to human health.” Invasive plants compromise the ability to manage public lands for a healthy native ecosystem. Invasive

plants can create a host of environmental effects that can be harmful to native ecosystem processes, including: displacement of native plants; reduction in functionality of habitat and forage for wildlife and livestock; increased potential for soil erosion and reduced water quality; alteration of physical and biological properties of soil; loss of long- term riparian area function; loss of habitat for culturally important plants; high economic cost of controlling noxious and invasive weeds; and increased cost of keeping recreational sites free of noxious and invasive weed species.

“Noxious” is a legal term, used by regulatory agencies, such as the California Department of Food and Agriculture (CDFA) and the U. S. Department of Agriculture Animal Plant Health Inspection Service (USDA-APHIS) to describe plants considered to be a threat to agriculture and/or non-crop areas. To be considered noxious, a plant has to be listed on a noxious weed list maintained by one or both of these agencies. In California, CDFA has started to also list invasive plants based on their threat or impact to wildlands.

California classifies invasive and noxious weeds as a method of prioritizing their control and publishes lists by classification (Class A through C). The HTNF incorporates this list as they apply to National Forest System lands.

- Class A weeds are typically given the highest priority for treatment. These weeds either currently do not occur in the state or occur in such low numbers that eradication is considered possible. Prevention and eradication are the treatment goals for Class A weeds.
- Class B weeds are invasive weeds with populations of varying distribution and densities within the state. The level of mandated control is based on local conditions. These weeds may require eradication within certain areas of the state. Eradication and control are the treatment goals for Class B weeds.
- Class C weeds are widespread and common within the state. Control is generally the treatment goal for Class C weeds.

### **Project Location**

The project area is located across the Bridgeport and Carson Ranger Districts in Alpine, El Dorado, Lassen, Mono, Nevada, Placer, Plumas, Sierra, and Tuolumne counties, California (Figure 1). The integrated weed management plan would provide direction for treatment of noxious and invasive weed species across approximately 693,721 acres on the two ranger districts and located in California (Table 1). Figure one provide a vicinity map that illustrates the project area. Figures 2 - 4 show the current locations of invasive weed populations in the northern portion of the project area (Figure 2) and the central portion of the project area (Figure 3) and the southern portion of the project area (Figure 4).

Figure 2. Current invasive weed populations within the northern portion of the project area

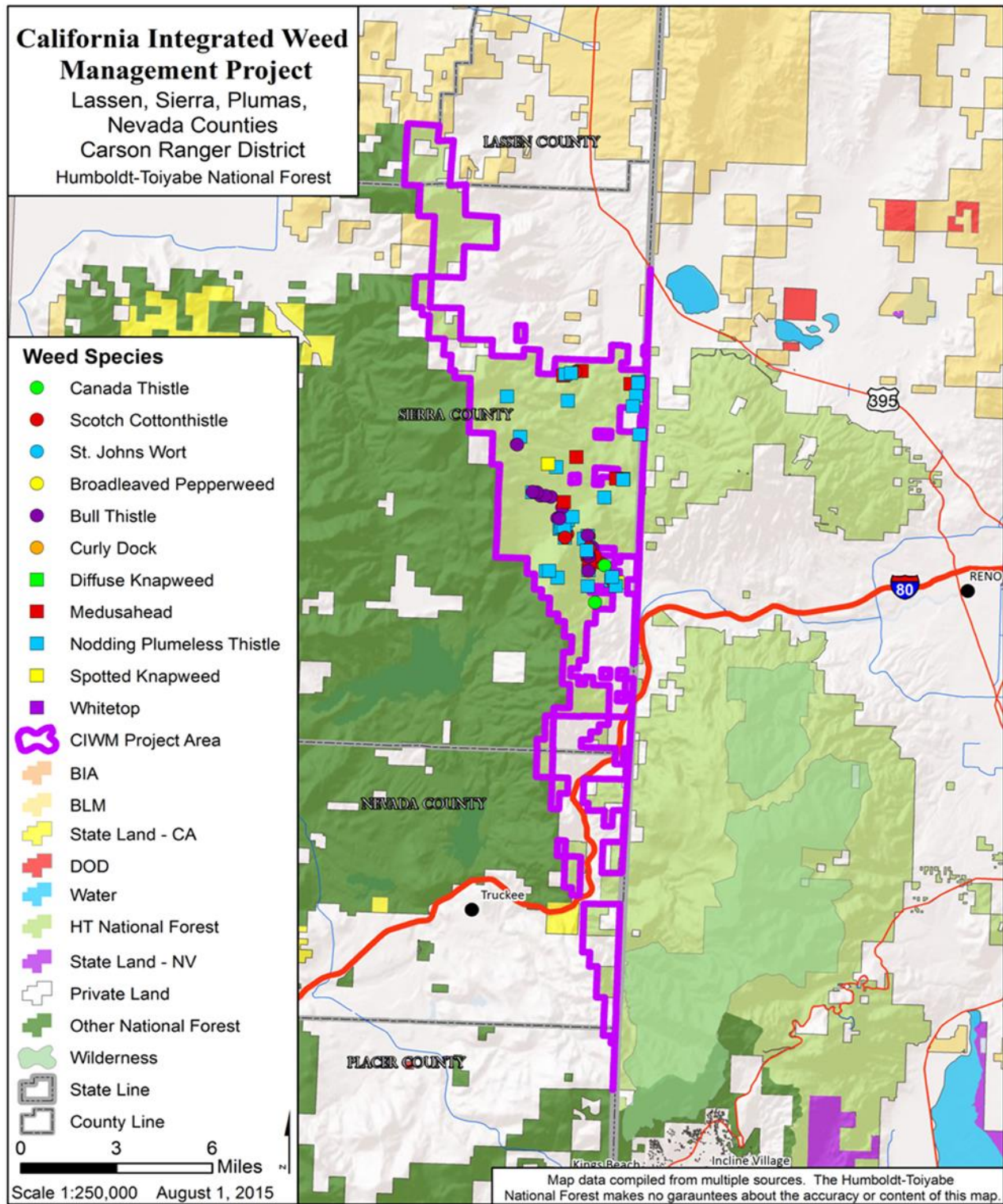


Figure 3. Current invasive weed populations in the central portion of the project area

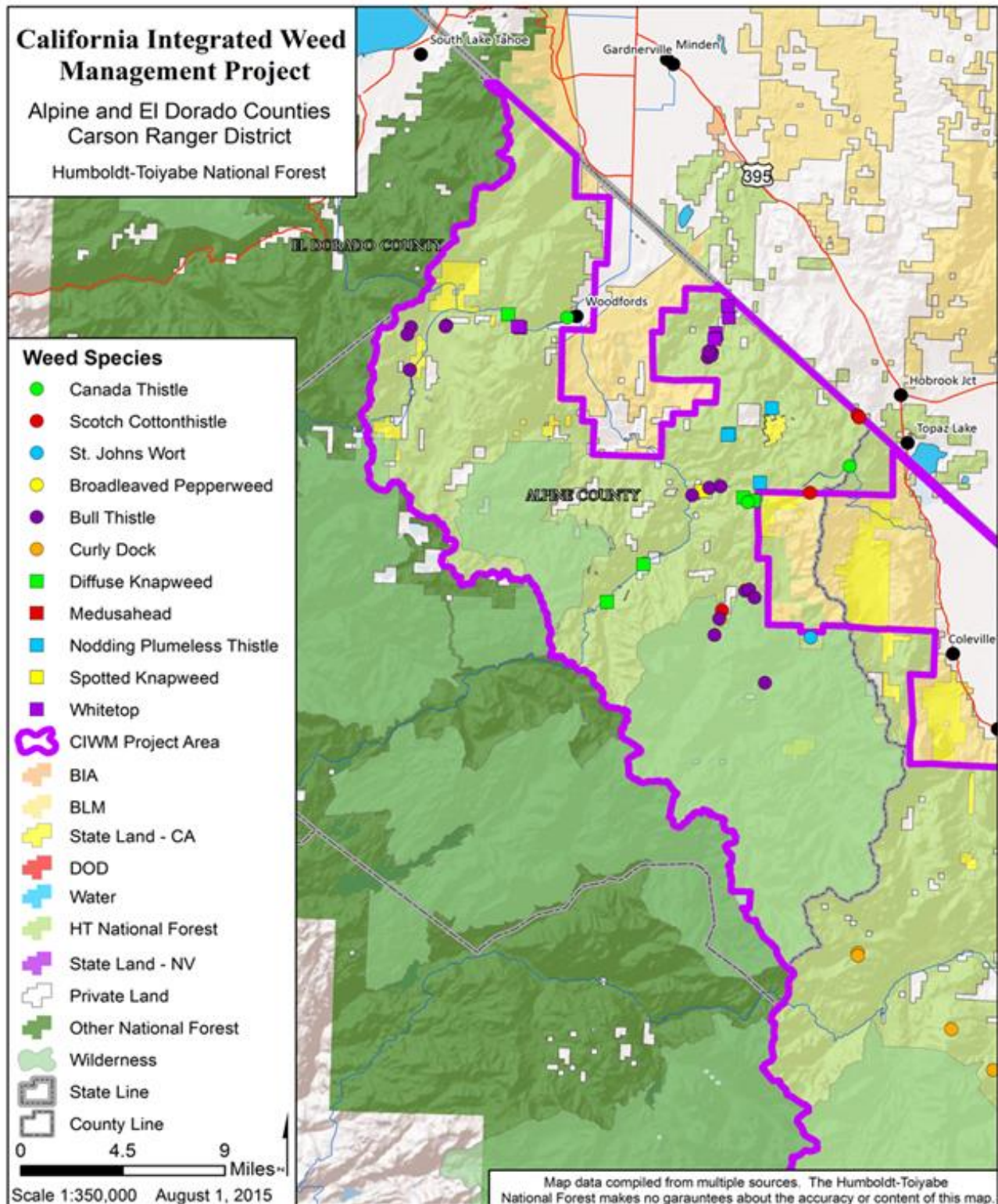
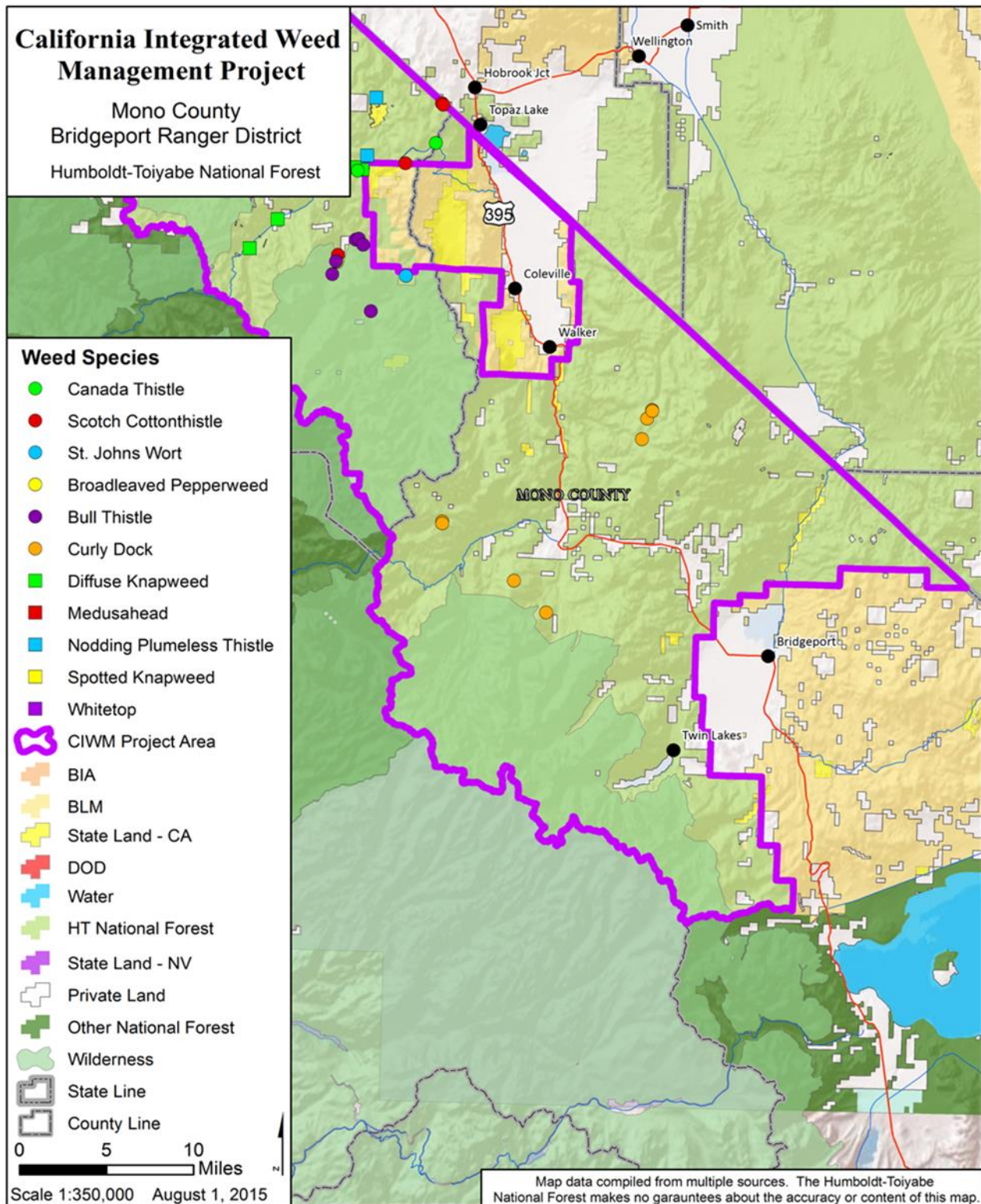


Figure 4. Current invasive weed populations in the southern portion of the project area



**Table 1. Acres of Humboldt-Toiyabe National Forest (HTNF) System Lands that occur within California (Project Area).**

| <b>County</b> | <b>Ranger District</b> | <b>Acre of Land in California within HTNF Jurisdiction</b> |
|---------------|------------------------|--|
| Lassen        | Carson                 | 1,616  |
| Plumas        | Carson                 | 7  |
| Nevada        | Carson                 | 4,369  |
| Sierra        | Carson                 | 30,029   |
| El Dorado     | Carson                 | 45   |
| Placer        | Carson                 | 68   |
| Alpine        | Carson                 | 254,459  |
| Mono          | Bridgeport             | 402,808  |
| Tuolumne      | Bridgeport             | 320  |
| <b>TOTAL:</b> |                        | <b>693,721</b>   |

### **III. PROPOSED ACTION**

This Biological Evaluation analyzes potential impacts to Forest Sensitive species from activities associated with the Proposed Action. Impacts associated with the No Action Alternative were also analyzed and included in the Wildlife Specialist Report CAIWMP project record).

The Proposed Action includes annually treating a portion of the invasive plant infestations that occur in California on the Humboldt-Toiyabe National Forest. The number of infestations and acres treated each year will depend upon available funding. Treatments would involve an integrated approach that in some circumstances involve the use of a combination of methods including manual (hand pulling), biological controls, herbicides, mechanical and prescribed burning methods over several years. The proposed action would include treating existing populations as well as any future infestations that might occur.

#### **A. Implementing Treatment Strategies**

Based in part on the California and Nevada State classification systems discussed in Section II, for each known invasive plant infestation, and for future infestations that may be discovered, one of three treatment strategies is proposed:

- Annually treat and monitor the infestation with the goal of eradication.
  - Infestations of species documented as highly invasive with severe or substantial ecological impacts in California and those that are currently limited in their distribution and abundance on the Forest making their eradication an achievable goal.
- Treat and monitor a portion of the identified occurrences each year, focusing on reducing the area coverage and amount over time (eradicate/control).
  - Under this strategy, invasive plant species would be annually treated, focusing first on eradicating and then containing the most isolated, outlying occurrences and, over time, reducing the footprint of larger, less isolated occurrences. Treatments will also be designed to contain infestations along transit routes in order to prevent these invasive plants from moving into natural forest settings. Where appropriate, restoration and reclamation activities would be designed to lower spread potential.
- Treat only leading edge infestations or where concurrent with higher priority species (control)

- Under this strategy targeted efforts to control, contain or eradicate certain species would be a lower priority for one or more of the following reasons: 1) the species is less invasive and unlikely to create large monocultures on NFS lands; 2) the species cannot be feasibly addressed with available treatments at the Forest- wide scale; or 3) the species is not causing significant ecological impacts.

**Criteria for prioritizing treatment sites, given limited funding, will follow the following guidelines:**

- Infestations with a high potential for future spread (prolific species found in high traffic areas such as administrative sites, trailheads, major access points for the forest, and systems vulnerable to invasion (recent fires)
- High value areas (such as TEP habitat; Wilderness, etc) and portals to these areas
- Early invaders with small isolated infestations on the forest.
- Leading edge and satellite occurrences of larger more established infestations
- Treating the perimeter of larger infestations

Using the above criteria, in addition to other site specific information, the HTNF will focus on 13 non-native invasive species (Table 2) for treatment and monitoring. Of the 13 species listed below, 10 are included on both the California and Nevada State Noxious Weed lists. Where the classification goal differs between the States (prevention, control, eradicate); site specific information and local knowledge of infestations was used to determine a treatment goal. For reference the classification system is provided again below:

- Class A weeds are typically given the highest priority for treatment. These weeds either currently do not occur in the state or occur in such low numbers that eradication is considered possible. Prevention and eradication are the treatment goals for Class A weeds.
- Class B weeds are invasive weeds with populations of varying distribution and densities within the state. The level of mandated control is based on local conditions. These weeds may require eradication within certain areas of the state. Eradication and control are the treatment goals for Class B weeds.
- Class C weeds are widespread and common within the state. Control is generally the treatment goal for Class C weeds.

**Table 2.** Priority weed species for treatment and associated treatment goal. <sup>1</sup> Curly dock is not on the CA or NV Noxious Weed List; however it has been documented in habitat for threatened and endangered species within the project area.

| Weed Species  | Mapped acres on HTNF Lands in CIWMP area | Number of Individual Locations | CA State Weed List Category | NV State Weed List Category | Treatment Goal        | Species Description   |
|---|--|--------------------------------|-----------------------------|-----------------------------|-----------------------|---|
| <b>Russian Knapweed</b><br>( <i>Acroptilon repens</i> ) | 0  | 0                              | B                           | B                           | Prevention            | Perennial weed that has a creeping root system. It reproduces by roots and seed. Manual treatments (hand pulling) effective for small populations; pre-emergent (fall) herbicide applications for larger more established populations |
| <b>Diffuse Knapweed</b><br>( <i>Centaurea diffusa</i> ) | 2  | 12                             | A                           | B                           | Control/<br>Eradicate | Tap-rooted biennial, occasionally annual or short-lived perennial forb that reproduces by seed. Can be hand pulled in spring before flowering; spring herbicide application for larger populations; mowing ineffective                |

| Weed Species  | Mapped acres on HTNF Lands in CIWMP area | Number of Individual Locations | CA State Weed List Category | NV State Weed List Category | Treatment Goal        | Species Description  |
|---|--|--------------------------------|-----------------------------|-----------------------------|-----------------------|--|
| <b>Spotted knapweed</b><br>( <i>Centaurea maculosa</i> )                              | 5  | 4                              | A                           | A                           | Control/<br>Eradicate | Short lived perennial that reproduces solely by seed. Same treatment as diffuse knapweed   |
| <b>Musk Thistle (nodding plumeless thistle)</b><br>( <i>Carduus nutans</i> )          | 462                                      | 57                             | A                           | B                           | Control               | Biennial weed that has a deep, fleshy taproot and reproduces by seed. Herbicide application during reproductive period most effective treatment method; Insect Bio-control                         |
| <b>Scotch Thistle</b><br>( <i>Onopordum acanthium</i> )                               | 12                                       | 21                             | A                           | B                           | Control               | Biennial weed that reproduces by seed. Can form dense stands that are difficult to penetrate. Herbicide application of rosettes in fall most effective   |
| <b>Bull Thistle</b><br>( <i>Cirsium vulgare</i> )                                     | 234                                      | 62                             | N/A                         | N/A                         | Control               | Short-rooted biennial weed that reproduces by seed; hand pulling very effective; herbicide application of rosettes in fall or spring also effective; insect bio-controls effective.                |
| <b>Canada Thistle</b><br>( <i>Cirsium arvense</i> )                                   | 8  | 19                             | B                           | C                           | Control               | Perennial weed that has a deep, extensive creeping root system. Repeated mowing followed by herbicide most effective; several effective insect bio-controls  |
| <b>Yellow-Star Thistle</b><br>( <i>Centaurea solstitialis</i> )                       | 4  | 3                              | C                           | A                           | Control/<br>Eradicate | Annual weed that reproduces by seed and can have a long tap root. Mowing and hand pulling effective if at right time; targeted grazing and insect bio-controls can be very effective               |
| <b>Perennial Pepperweed (broad-leaf pepperweed)</b><br>( <i>Lepidium latifolium</i> ) | 12                                       | 5                              | B                           | C                           | Control               | Perennial weed that has a creeping root system and can be found in moist areas and pastures. Hand pull for small infestations ( a few plants); targeted grazing followed by herbicide application; |
| <b>Hoary Cress (whitetop)</b><br>( <i>Cardaria draba</i> )                            | 204                                      | 19                             | B                           | C                           | Control               | Perennial weed that reproduces through roots and seed. Hand pull small infestations; mowing and herbicide  |
| <b>Medusahead</b><br>( <i>Taeniatherum caput-medusae</i> )                            | 223                                      | 13                             | C                           | B                           | Control               | Annual invasive grass that reproduces by seed. Mowing, prescribed fire, herbicides can all be effective treatment  |
| <b>Cheatgrass</b> ( <i>Bromus tectorum</i> )  | unknown                                  | unknown                        | N/A                         | N/A                         | Control               | See medusahead; targeted grazing also effective  |
| <b>Curly dock</b> ( <i>Rumex crispus</i> ) <sup>1</sup>                               | unknown                                  | unknown                        | N/A                         | N/A                         | Control               | Perennial prolific seed producer; occurs in drainages and wetter portions of pastures; hand pulling/digging or herbicide treatments  |

## B. Additional Details Of The Proposed Action

### PREVENTION

A major component of the CIWMP will include incorporating measures into project planning and project implementation that prevent, or greatly reduce the potential for weeds to become established. To prevent the spread of noxious and invasive weeds, the following preventive measures will be incorporated into the CIWMP:

- **Noxious Weed Risk Assessment** –Forest Service Manual 2081.02 requires a noxious weed assessment be conducted when any ground disturbing action or activity is proposed to determine the risk of introducing or spreading noxious weeds associated with the proposed action. For projects having moderate to high risk of introducing or spreading noxious weeds, the project decision document must identify noxious weed control measures that must be undertaken during and/or before project implementation. The Risk Assessment includes information on current condition of the project area, potential risk of increased spread and design features to minimize potential for new infestations. The Assessment also determines if weed treatments need to occur prior to commencement of project activities.
- **Best Management Practices** (BMPs)-incorporate BMPS for weed prevention into all project planning efforts which include a ground disturbing component. BMPS include (but not limited to):
  - Require all construction vehicles to be inspected for weeds prior to entering work site
  - Set up weed wash stations and clean all equipment before leaving the project site if operating in areas infested with weeds.
  - All sand, gravel, borrow, and fill material will be inspected and certified weed free
  - Locate and use weed-free project staging areas. Avoid or minimize all types of travel through weed-infested areas, or restrict travel to periods when the spread of seeds or propagules is least likely;
  - To the extent feasible, design project areas to avoid known noxious weed infestations; if unavoidable then assess if pretreatment needs to be conducted prior to construction activities
  - Before ground-disturbing activities begin, inventory weed infestations and prioritize areas for treatment in project operating areas and along access routes;
  - Incorporate a post monitoring and treatment plan into all ground disturbing project planning efforts. Monitoring should continue for a minimum of five years after the project is completed to assure an Early Detection Rapid Response (EDRR) to new infestations.

**Revegetation/Restoration** (following Forest Service project activities)-

Revegetation will involve site preparation, such as raking to prepare a seed bed to promote seed germination, planting of seeds and/or propagules (depending on the species, this is done either in early spring or late fall to take advantage of available moisture), vigilant treatment of invasive plants as they germinate from the existing seedbank, and monitoring the results. In some cases, a follow-up seeding/planting may need to be done.

Revegetation with carefully selected plant materials is a critical component of integrated weed management strategies. Commonly used control tactics, such as manual or chemical treatments, in effect create a disturbance on the current vegetation community. These control tactics may eliminate or suppress target invasive species in the short term, but the resulting gaps in vegetation and bare soil create open niches susceptible to secondary invasion by the same or other undesirable plant species. The spot method can leave sites open to secondary invasion since larger areas of vegetation are eliminated.

Spot spray areas would be reviewed and determination made about the need for active restoration. Areas with bare soil created by the treatment of invasive plants would be evaluated for restoration

needs by a botanist and soil scientist. Revegetation would occur where needed to meet resource goals, including desired conditions for ground cover and native plant composition.

Determining the need for active restoration/revegetation versus passive restoration (allowing plants on site to fill in a treated area) is the first step when addressing this need. Passive restoration depends on re-colonization from the existing seedbank and from plant propagules dispersed from surrounding sources, as well as native species from within the invasive plant site. Passive restoration may be appropriate where treated sites leave relatively little bare ground or along less-disturbed roadsides where adjacent native vegetation can provide adequate seed source to recolonize treated areas.

Active revegetation is a long-term commitment that would be focused on areas that are either ecologically unique, or where active revegetation is necessary to provide competition for highly aggressive invasive plant species. In some cases, active restoration is not the preferred choice due to the nature of the site. Examples include continually disturbed areas, such as road shoulders that are frequently maintained, active landings, and river banks that are prone to annual scouring.

Old roadbeds, mining sites, are examples of sites that are unproductive but need stabilization. Revegetation may be difficult since these sites are not yet ready to support desired native vegetation. Applying groundcover with mulch stabilizes the site against erosion, while creating a weed barrier. For these extreme cases, the initial site stabilization methods are the first stage for future revegetation efforts. The following best management practices would be applied during any restoration efforts:

- Include weed prevention measures, including project inspection and documentation during project operations;
- Retain bonds until reclamation requirements, including weed treatments, are completed, based on inspection and documentation;
- To prevent conditions favoring weed establishment, re-establish vegetation on bare ground caused by project disturbance as soon as possible using either natural recovery or artificial techniques;
- Maintain stockpiled, weed-free material in a weed-free condition;
- Revegetate disturbed soil in a manner that optimizes plant establishment for each specific project site. Revegetation may include topsoil replacement, planting, seeding, fertilization, liming, and weed-free mulching, as necessary.
- Inspect seed and straw mulch to be used for site rehabilitation (for wattles, straw bales, dams, etc.) and certify that they are free of weed seed and propagules;
- Inspect and document all limited term ground-disturbing operations in weed infested areas for at least three growing seasons following completion of the project;
- Use native material where appropriate and feasible. Use certified weed-free or weed- seed-free hay or straw where certified materials are required and/or are reasonably available;
- Provide briefings that identify operational practices to reduce weed spread (for example, avoiding known weed infestation areas when locating fire lines);
- Evaluate options, including closure, to regulate the flow of traffic on sites where desired vegetation needs to be established.

## INVENTORY

Information on the presence, location and distribution of noxious and invasive weeds is a key first step to all subsequent management efforts. Once located, noxious and invasive weeds would be mapped in GIS and recorded in the Forest Service FACTS database. Mapping provides information about the extent of the infestation, transport vectors, and the effectiveness of the control methods. Over the long-term, mapping can provide historical data for the epicenter of an infestation, rate and direction of spread.

## CONTROL/ERADICATION

### *Manual Methods*

Manual treatment involves the use of hand tools to cut, clear, or prune herbaceous and woody species. Treatments include cutting noxious and invasive weeds above the ground level; pulling, grubbing, or digging out root systems of undesired plants to prevent sprouting and regrowth; cutting at the ground level or removing competing plants around desired species; or placing mulch around desired vegetation to limit competitive growth.

- **Hand Pulling:** Pulling or uprooting plants can be effective against some shrubs, tree saplings, and herbaceous invasive plants. Annuals and tap-rooted plants are particularly susceptible to control by hand-pulling. It is not as effective against many perennial invasive plants with deep underground stems and roots that are often left behind to re-sprout. The advantages of pulling include its small ecological impact, minimal damage to neighboring plants, and low (or no) cost for equipment or supplies.
- **Pulling Using Tools:** Most plant-pulling tools are designed to grip the plant stem and provide the leverage necessary to pull its roots out.
- **Clipping:** “Clipping” means to cut or remove seed heads and/or fruiting bodies to prevent germination. This method is labor-intensive and effective for small and spotty infestations.
- **Mulching:** Covering with certified “weed free and plastic free” mulch such as rice straw, grass clippings, wood chips, newspaper. Requires regular maintenance to assure mulch is maintained in targeted area.
- **Tarping:** Placing tarps to shade out weeds or solarize them (to injure by long exposure to heat of the sun). Requires regular maintenance to assure tarps are secure, intact and achieving desired results.

### *Mechanical Methods*

- **Mowing-** Mowing is a suppression measure that can prevent or decrease seed head production. To be effective in treating invasive species such as annual grasses (cheatgrass), mowing needs to occur every two to three weeks until flowering is completed. Mowed weeds will re-grow and set seed from a reduced height so a combined control method is generally necessary to be effective. Mowing would be conducted using a small (700 lb) Bobcat ®-loader equipped with a mower attachment. Because mowing requires repeated treatments in the same year, can only be used on relatively flat (slopes less than 20%) and non-rocky terrain, this method will only be used in rare circumstances to treat small (less than 20 acres) infestations of invasive grasses. Mowing of

invasive grasses over a small area produce minimal biomass and will not suppress native plant regeneration.

- **Cutting with a Hand-held String or Blade Trimmer:** Mowing or cutting with handheld gas or battery powered string or blade trimmer. Treatment method is essentially the same as described above for the Bobcat ® mower but would generally be used to treat much smaller areas (less than one acre). Again this treatment would be rarely used as it requires multiple cuttings to be effective and follow up treatments with other controls such as herbicide or biological controls.

### *Biological Controls*

- Biological control involves using living organisms, such as insects or grazing animals to suppress weed infestations. This treatment method is generally most appropriate in situations where weed infestations are large and well established, and on sites where other control methods are not feasible. Biocontrol methods generally suppress host weed populations, but may not eradicate them.
- **Insects-**Biological control using insects is used to reduce a targeted weed population to an acceptable level by stressing target plants and reducing competition with the desired plant species. Insect agents are generally used for large expansive monocultures of noxious and invasive species. Insect agents including plant eating insects, nematodes, flies, mites and, pathogens typically require 3-5 years for establishment and can limit the spread and density of target weed species by feeding on leaves, stems, roots and/or seed heads. Insects can affect plants directly by destroying vital plant tissues and functions, and indirectly, by increasing stress on the plant, which may reduce its ability to compete with other plants. Often, several biological control agents are used together to reduce noxious and invasive weeds density to an acceptable level. Only biological control agents that are permitted for release by the USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) will be used. Before being permitted by APHIS and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018).

**Targeted Grazing-** In targeted grazing, the kind of animals and amount and duration of grazing are specifically designed to help control a particular species of plant while minimizing the impacts on perennial native vegetation that is needed to help reduce the likelihood of reinvasion by undesirable plant species. Targeted grazing includes the use of goats, sheep, or other livestock that have been specifically ‘trained’ by their operators to eat certain plant species. Generally the operator also uses a portable fencing system to help ‘target’ the animals on focal species. Grazing animals, either alone or in combination with other treatment methods, can be highly effective in reducing weed populations through the use of targeted grazing prescriptions. Domestic animals, such as cattle, sheep, or goats, control the top-growth of certain noxious and invasive weeds which can help to weaken the plants and reduce the reproduction potential. The animals benefit by using the weeds as a food source and, after a brief adjustment period, can consume 50 percent or more of their daily diet of the weed, depending on the animal species. Although some Forest Service livestock grazing permits include authorizing cattle to graze invasive species such as cheatgrass, under the California Integrated Weed Management Project, livestock are only used under specific “targeted grazing” conditions.

## *Other Treatment Methods*

**Prescribed Burning-** Prescribed burning would only be used in very limited situations where burning could help achieve management objectives. Prescribed burning is often used to control large expansive monocultures of cheatgrass and medusahead infestations. To be successful, burning would be conducted under very precise environmental conditions with intense management and oversight. A site specific burn plan and close consultation and coordination with a fuels specialist, would be completed before any prescribed burning activities occurred. Prescribed burning almost always needs to be conducted with other weed treatments to remove vegetation other treatments (e.g. herbicide, seeding etc). Prescribed burning will not be conducted in any occupied or critical habitat for threatened, endangered or proposed species.

## *Herbicide Methods*

Chemical treatment involves the application of herbicides (chemical compounds), via a variety of application methods, at certain plant growth stages to kill noxious and invasive weed species. Depending on the type of herbicide selected, they can be used for noxious and invasive weed control or complete eradication and may be used in combination with other control treatments. Selection of an herbicide for site-specific application would depend on its chemical effectiveness on a particular noxious or invasive weed species, habitat types present, proximity to water, and presence or absence of sensitive plant, wildlife, and fish species. Herbicides are most effective on pure stands of a single noxious or invasive weed plant where desirable and non-target plants are scarce or absent.

Chemicals can be used alone or in tank mixtures. Tank mixtures are only used if existing recommendations are available from State Department of Agriculture or other official resources such as Universities and or County cooperative extensions. If two or more different chemicals of the formulations are approved as a tank mixture on one or more of the labels, or have written recommendations for a tank mixture from the State Department of Agriculture, then it is permissible to tank mix these chemicals for a spray program. In addition to herbicides, a blue dye is added to tank mixtures to assist with monitoring the extent of the treatment coverage. The dye helps to reduce the chance of under and over application and would help detect and manage drift. Use of dye also reduces the risk to non-target species as a result of over application of herbicide and assures treatment of target species. Dye is water soluble, breaks down in sunlight, and washes away easily with water.

Herbicides would be used to control and eliminate new areas of noxious and invasive weeds spread and to contain the spread of existing infestations. Depending on the level of infestation, the type of weed species (e.g. deep rooted perennial or biannual) and/or its proximity to sensitive areas (e.g. water) herbicides can be applied through a variety of methods as described below:

- **Directed Broadcast/Spot Spray/Foliar spray-** Accomplished by sprayer wand with regulated nozzle in such a fashion that spray is concentrated at the target species. This is typically accomplished using a backpack sprayer.
- **Broadcast Spray-** Broadcast application (using truck/UTV mounted sprayers) over wider areas would be used only when necessary to treat large infestations. In some instances, broadcast spraying may be the only effective way to treat very dense and extensive weed infestations. When using broadcast spray drift reduction measures will be used. This will include low spray pressure of

30PSI or less, spray nozzles with large orifices. Wind speeds of 8mph or less and no treatment if inversions are present. Drift cards will be used to help monitor spray applications.

- **Hand/Selective-** Treatment of individual plants to avoid spraying other desirable plants. There is a low likelihood of drift or delivery of herbicides away from treatment sites. This method is used in sensitive areas, such as near water, to avoid getting any herbicide on the soil or in the water. Hand/Selective methods could be done under more variable conditions than spot spraying or broadcast spraying. Specific methods include:
  - Dip and clip – similar to cut stump, where cutting tool is first dipped in herbicide, then used to cut target species to be treated
  - Cut stump – herbicide is sprayed on cut surfaces to eliminate or greatly reduce re-sprouts;
  - Wicking and wiping – herbicide is wiped onto the target species using a wick applicator.

### *Proposed Herbicides*

Seven herbicides are proposed for use in this project, using the application methods described above: ***aminopyralid, chlorsulfuron, glyphosate, imazapyr, triclopyr, rimsulfuron and sulfometuron-methyl.***

When appropriate, herbicides with different modes of action can be used to treat invasive plant species. Alternating herbicide types can help reduce the risk of populations developing herbicide tolerance from repeated application with the same herbicide.

Only herbicides that have been approved for use in the state of California and have a label certifying that the chemical has been approved for use by the Federal Environmental Protection Agency (EPA) and the California Department of Pesticide Regulation (DPR), would be used. The EPA requires the manufacturers to conduct ecological risk assessments that include toxicity testing on representative species of birds, mammals, freshwater fish, aquatic invertebrates, and terrestrial and aquatic plants. An ecological risk assessment uses the data collected to evaluate the likelihood that adverse ecological effects may occur as a result of herbicide use.

The Forest Service also conducts its own risk assessments, focusing specifically on the type of herbicide uses in forestry applications. The Forest Service contracts with Syracuse Environmental Research Associates, Inc. (SERA) to conduct human health and ecological risk assessments for herbicides that may be proposed for use on NFS lands (SERA 2007). The SERA risk assessments represent the best science available, using peer-reviewed articles from the scientific literature and current U.S. EPA documents, such as Confidential Business Information, to estimate the risk of adverse effects to non-target organisms. The risk assessments consider worst-case scenarios including accidental exposures and application at maximum label rates. Once a risk assessment is completed, pesticide use proposals are submitted to the Forest Supervisor for approval. Only herbicides that have SERA risk assessments and approved Pesticide Use proposals are proposed in this action, with the exception of one chemical, rimsulfuron. Rimsulfuron is an effective herbicide in the treatment of annual grasses and is preferable over Sulfometuron-methyl due to its relative stability in soils and overall better environmental characteristics. The Forest Service is in the process of developing a Pesticide Use Proposal for rimsulfuron. Once a USFS Pesticide Use Proposal is completed, the HTNF will no longer use sulfometuron-methyl and will replace it with rimsulfuron for the treatment of annual grasses.

Label directions, as well as all laws and regulations governing the use of pesticides, as required by the U.S. Environmental Protection Agency, the California Department of Pesticide Regulation, and Forest Service policy pertaining to pesticide use, would be followed. Coordination with the appropriate County Agricultural Commissioners would occur, and all required licenses and permits would be obtained prior to any pesticide application. The label contains information about the product, including its relative toxicity, potential hazard to humans and the environment, directions for use, storage and disposal, and first aid treatment in case of exposure. Label directions provide for public and worker safety by requiring posting of treated areas, pre-designation of mixing, storage and filling sites, and transportation and handling practices in accordance with toxicity of each formulation. Where herbicide treatments are proposed, the lowest effective label rates would be used. A site-specific safety and spill plan would be developed prior to herbicide applications.

The following is a short description of the proposed herbicides and their uses:

**Aminopyralid**-Aminopyralid is a pre- and post-emergent herbicide that can control a number of key invasive broadleaf species. Aminopyralid provides residual weed control activity, reducing the germination of target plants and the need for re-treatment. The herbicide has a lower effective application rate (compared to other registered herbicides) and a non-volatile formulation. Aminopyralid is labeled in California for use to the water's edge. For best results aminopyralid is generally applied to young weeds that are actively growing during time of application. It is proposed for use primarily on starthistles, knapweeds, and Canada thistle using directed foliar spray, broadcast spray or wicking. Broadcast spray would be limited to disturbed areas dominated by non-native species. A product example is **Milestone**.

**Chlorsulfuron**-Chlorsulfuron is a selective pre- and post-emergent herbicide used to control many broadleaf species. Chlorsulfuron would be used primarily as a post-emergent for use on tall whitetop, (*Lepidium latifolium*) and hoarycress (*Cardaria spp.*), using directed foliar spray or wiping. A product example is **Telar**.

**Glyphosate**- Glyphosate is a non-selective systemic herbicide that can control most annual and perennial plants. Glyphosate rapidly binds to soils, and is not readily absorbed by plants roots. Its non-selectiveness causes this herbicide to kill most plants where applied, including desirable native species. Plants can take several weeks to die and a repeat application in the same season is sometimes necessary to remove plants that were missed during the first application. Only formulations *without* a premixed surfactant are being proposed for use. The Forest Service proposes to use glyphosate only in limited situations within the project area, as more selective herbicides usually better meet the desire to treat only target species. Aquatic formulations of glyphosate can be used in aquatic settings and have minimal detrimental effects to aquatic species. Glyphosate will not be used in an area larger than one contiguous acre, and will likely almost always be used to treat much smaller areas. Product examples include **Accord**, **Rodeo** or **Aquamaster**.

**Imazapyr**-Imazapyr is a non-selective herbicide used for the control of a broad range of weeds including terrestrial annual and perennial grasses and broadleaved herbs, woody species, and riparian and emergent aquatic species. It can be applied pre-emergent, but is most effective when applied as a post-emergent herbicide. A product example is **Habitat**.

**Triclopyr**-Triclopyr is a selective post-emergent herbicide used to control woody and broadleaf plants. It is proposed for use primarily on woody species such as saltcedar (*Tamarix ramosissima*). Application for

woody species would include cut stump, directed foliar spray or wiping. **Garlon 3A** is a product example.

**Rimsulfuron-** Rimsulfuron is an effective herbicide to control annual grasses such as cheatgrass and medusahead. It is absorbed through the plants leaves and translocated to the growing point of the plant. This product is designed to be used in dry areas and will not be used near any wet meadows, marshy areas, or riparian areas. This herbicide can be applied as a pre or post-emergent. **Matrix** is a product example.

**Sulfometuron-methyl-** Sulfometuron-methyl is a selective herbicide and will be used for pre-emergent control of annual grasses such as medusahead or cheatgrass. In some cases a mix of Sulfometuron methyl and chlorsulfuron (Landmark) will be use. This product is designed to be used in dry areas and will not be used near any wet meadows, marshy areas, or riparian areas. **Oust** is a product example. As mentioned above, this chemical will eventually be replaced by Rimsulfuron and no longer used on the HTNF.

### *Surfactants*

Herbicide treatments would include the use of a surfactant to enable herbicide penetration of the plant cuticle (a thick, waxy layer present on leaves and stems of most plants). Surfactants are materials that facilitate the activity of herbicides through emulsifying, wetting, spreading or otherwise modifying the properties of liquid chemicals. Treatments would also include use of a dye to assist the applicator in efficiently treating target plants and avoiding contact with plants that have already been treated. A methylated seed oil surfactant, such as Hasten or Competitor, would be used as a surfactant and a water soluble dye, such as Highlight Blue, would be used as a dye. Both the surfactant and the dye are considered to be virtually non-toxic to humans.

## MONITORING

Post-treatment monitoring will occur on all treatment sites to determine if treatment methods were successful. Level of success determinations will be commensurate with the treatment goal of the site (i.e. eradicate, control etc.). For example, if the objective was eradication, post-treatment monitoring would focus on a visual inspection of the treatment area for the presence or absence of the noxious or invasive weed species. This treatment would be considered successful when the target species is absent from its former location. Treatments designed to contain, control or suppress would be based on quantitative inspection (i.e. a reduction in percent cover or size of infestation of the noxious or invasive weed). If monitoring demonstrates that a treatment has not been effective, corrective actions (such as retreatment with the same or different method, or combination of methods) would be identified and implemented to enhance the level of success.

## ANNUAL IMPLEMENTATION PROCESS

The Annual Implementation Process will include a yearly pre-treatment assessment of current weed conditions and will provide an annual plan for how, when, and where weeds will be treated. This process will include the coordination between the Forest Service Resource specialists and the District noxious weed program manager. The team will review up to date weed maps and proposed treatment areas and provide feedback on appropriate design features, special notifications, or other issues that may be associated with treatments. The Implementation Process will also help to prioritize treatment areas based

on updated inventory information, proximity to sensitive areas, and/or the EDRR to newly discovered weed populations.

## DESIGN FEATURES

### Soils/Watershed

**Issue:** The use of herbicide treatments may negatively affect soil conditions and or increase the risk of contaminating watersheds through drift and groundwater seepage.

1. Applicators will be briefed about the locations of water sources prior to beginning work and buffers will be flagged on the ground.
2. Within 50 feet of perennial rivers, streams, lake, wet meadows, and other water bodies, including seasonally flooded areas, the preferred treatment would be manual weed removal.
3. Herbicide applications will not be conducted during rain nor immediately following rain when soil is saturated or runoff, standing water, or a heavy dew is present.
4. Application will occur only under favorable weather conditions, defined as:
  - 30% or less chance of precipitation on the day of application based upon NOAA weather forecasting. If rain, showers or light rains are predicted within 48 hours, the amount of rain predicted shall be no more than ¼ inch of rain, and rain does not appear likely at the time of application.
5. Mixing or application of herbicides will not occur within 100 feet of a well or spring used as a domestic water source.
6. Within 50 feet of a perennial waterway, only herbicides and surfactants that are registered with the California Department of Pesticide Regulation for aquatic use will be used.
7. Chlorsulfuron, Triclopyr, and Sulfometuron-methyl will not be applied within 50 feet of perennial rivers, streams, lakes, wet meadows, and other water bodies, including seasonally flooded SEZs.
8. Between 50 and 10 feet of a perennial waterway, herbicide application methods may only include spot spraying, dip and clip and or wicking and wiping methods.
9. Within 10 feet of a perennial waterway, only dip and clip and/or wicking and wiping methods will be used.
10. Preparation of herbicides for application, including mixing or filling of tanks or backpacks, will take place outside of Riparian Conservation Areas and more than 300 feet from surface water.
11. Herbicide applications will not be conducted during rain nor immediately following rain when soil is saturated or runoff, standing water, or a heavy dew is present.
12. Follow the Lahontan Regional Water Quality Control Board Notification Protocol for all weed treatments. The protocol is included as Appendix B. Key components of the protocol are summarized here:

*Category I—No notification/consultation to Water Board staff is required prior to treatment if below criteria are met.*

- *Size and Cover Class Criteria for Category I:* Infestations that are less than ¼ acre in size and less than 25% total weed cover. The majority of infestations in the CAIWMP area fall within this category.

*Category II—48-hour turnaround from Water Board staff for emergency situations*

- *Size and Cover Class Criteria for Category II:* Infestations that are up to 1 acre in size and any cover class (excluding Category I, <1/4 acre and < 25% cover, which requires no Water Board notification).

*Category III- Full consultation with Water Board staff required prior to treatment.*

- *Size and Cover Class Criteria for Category III:* Any infestation greater than 1 acre, any infestation within 25 feet of a surface water; or non-emergency infestations (not Category II) from ¼ to 1 acre in area.

## **Wildlife (Aquatic and Terrestrial)**

**Issue:** Activities associated with treating noxious weeds may potentially affect aquatic and terrestrial wildlife species such as the Sierra Nevada yellow-legged frog, Yosemite toad, Lahontan and Paiute cutthroat trout, and Sierra Nevada bighorn sheep. Herbicides could affect these species directly and indirectly if over-concentrations of herbicide are applied or applied incorrectly. Other noxious weed treatments may also indirectly affect aquatic and terrestrial wildlife due to disturbance occurring during the breeding season, particularly if treatments include ground disturbing activities such as mowing and prescribed burning.

## **Federally Threatened or Endangered Amphibian Habitat (Sierra Nevada yellow-legged frog and Yosemite Toad)**

13. During the Annual Implementation Process, the Forest Fisheries Biologist will review new treatment sites identified under EDRR that are within 500 feet of Sierra Nevada yellow-legged frog or Yosemite toad suitable habitat. Treatment strategies in these areas will be developed collaboratively on an annual basis by the noxious weed coordinator, the Forest Fisheries Biologist and the U.S. Fish and Wildlife Service if necessary, to assure treatment efforts do not impact frog and toad populations.
14. Only manual methods (hand pulling, digging, clipping and bagging) or direct-hand application of herbicide (dip and clip, wick and wipe) will be used in habitat for SNYLF and YT. No other treatment methods may be used.

### ***In occupied habitat the following restrictions apply:***

15. Weed treatments will not be conducted within 50 feet of known breeding locations for Sierra Nevada yellow-legged frog and Yosemite toad until after metamorphosis has occurred. Metamorphosis typically occurs around July 31st and will be confirmed with a site-specific survey before weed treatment.
16. To minimize disturbance to Sierra Nevada yellow-legged frogs and Yosemite toads, treatments for these species may only occur on a maximum of ½ acre per year, not to exceed 1/10 of an acre in any given location.
17. Immediately prior to any treatment activities, a Forest Service biologist who is trained in identifying and handling rare amphibians will survey the area for Sierra Nevada yellow-legged frogs and/or Yosemite toads. If individuals are found they will be relocated to a safe location that

is nearby but out of potential harm's way from treatment activities. In most cases this will be less than 100 feet from the original location of the amphibian.

***Within potential breeding areas considered suitable habitat<sup>1</sup> (areas not yet surveyed for occupancy) for Sierra Nevada yellow-legged frogs (lakes and streams) or Yosemite toad (ponds and surrounding meadows) the following restrictions apply:***

18. A maximum of ½ acre will be treated per year, not to exceed 1/10 of an acre in any given location. If future surveys determine the suitable habitat is not occupied, treatment acre limits would no longer apply to that location.

#### **Federally Threatened or Endangered Fish Habitat (Lahontan and Paiute cutthroat trout)**

19. The Forest Fisheries Biologist will review new treatment sites that are within 300 ft of occupied Lahontan cutthroat trout or Paiute cutthroat trout streams to ensure treatment efforts follow design features outlined below.
20. When in proximity to Lahontan and Paiute (LCT) cutthroat trout habitat, every effort will be made to treat weeds by manual methods.
21. Only dip & clip and/or wicking & wiping applications of aquatic formulations of glyphosate or imazapyr will be used within 50 feet of ***occupied*** Lahontan and Paiute cutthroat trout habitat. No other herbicide treatment may be used.
22. Prescribed burn treatments will not occur within 300 feet of LCT or ***PCT occupied habitat***.
23. Tarping and mulching will not be used within ***occupied*** Lahontan (LCT) and Paiute cutthroat trout (PCT) habitat.
24. Mechanical methods (mowing, trimming) will not be permitted within 50 feet of an ***occupied LCT or PCT stream*** channel.
25. Targeted grazing will not be permitted within 50 feet of an ***occupied LCT or PCT stream*** channel.

#### **Federally Threatened or Endangered Terrestrial Wildlife – Sierra Nevada bighorn sheep**

26. Within Sierra Nevada bighorn sheep ***occupied and critical habitat***, every effort will be made to treat weeds by hand pulling and or clipping and bagging.
27. Hand pulling and herbicide application using dip and clip and wick or wipe techniques will be the only treatment methods used in Sierra Nevada bighorn sheep ***occupied and critical habitat***.
28. Weed treatments will not be conducted in any ***occupied*** habitat during the lambing period for Sierra Nevada bighorn sheep, which typically occurs between April and mid-July (USDI 2000).

#### **Terrestrial Wildlife – other**

29. Limited operating periods (LOPs) for all special status wildlife species will be implemented as necessary, based on the most current wildlife data from pre-project field surveys, or habitat suitability as determined by the district biologist. During the Annual Implementation Process, the

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<sup>1</sup> **Suitable habitat** consists of areas within the analysis area that are outside of critical habitat but meet the habitat characteristics defined in the primary constituent elements. Due to the lack of comprehensive surveys and the cryptic nature of the species', occurrences are unknown in these areas. (see Biological Assessment for details).

noxious weed coordinator will coordinate with the District and/or Forest wildlife biologist before each treatment season, to verify that treatments would not disturb breeding activity of any special status terrestrial wildlife species.

30. Triclopyr will not be used within 300 feet of an active Sierra Nevada willow flycatcher nesting territory.
31. The use of domestic sheep for targeted grazing will not be used in proximity to occupied bighorn sheep habitat.
32. Per Standards and Guidelines in the Greater Sage-grouse Bi-state Forest Plan Amendment (USDA 2016, Standard S-02), herbicide weed treatments will only occur outside of the critical disturbance period for Bi-State sage grouse (March 1 – May 15 (+/- 2 weeks depending on conditions). Herbicides should only be used in Bi-State sage grouse habitat if other integrated pest management approaches are inadequate or infeasible.
33. All additional pertinent 2016 Toiyabe Forest Plan Amendment standards and guidelines related to Bi-State sage grouse will also be reviewed and followed during treatment planning and implementation.

## Rare Plants

**Issue:** Noxious weed treatments could potentially affect non-target native plant communities including rare plant populations. The use of herbicides and potentially other treatment activities could impact individual plants as well as populations. Modification of the plant community structure and composition could impact sensitive plants and their habitats.

34. Where treatments occur within 500 feet of Threatened, Endangered, Candidate or Proposed, and Region 4 Forest Service Sensitive (TECPS) or HTNF Watch List plant occurrences, weed crews would be instructed in the proper identification of plant species to be avoided to ensure that individual TECPS or HTNF Watch List plants are protected.

## Federally Listed Threatened, Endangered, Proposed and Candidate Plants - *Ivesia webberi* (Threatened)

In **occupied habitat**, the following restrictions apply:

35. Herbicide treatment of grasses will occur in the fall when *Ivesia webberi* is dormant.
36. No herbicide application by truck or UTV mounted sprayers. All application will occur with backpack sprayers, spray wands, or other direct application equipment.
37. A small containment kit would be carried by herbicide applicators.
38. Only dip and clip or wick and wipe method will be used to apply herbicides to broad-leaf weeds.
39. Mixing and loading of herbicides prohibited.
40. No prescribed burning or mechanical treatments (mowing) will occur.
41. Mulching and tarping will not be used.
42. Within occupied habitat, the Forest Service District or Forest botanist will accompany weed crews when treatments are conducted

In unoccupied **designated critical habitat**, the following treatment restrictions apply:

43. To limit the potential for herbicide spills within *Ivesia webberi* habitat, no mixing and loading of herbicides would occur within occupied or unoccupied critical habitat for *Ivesia webberi*.

44. Survey within 500 feet of infestations identified for herbicide and biological treatment, and within 25 feet of new infestations identified for manual treatment. If *Ivesia webberi* plants are found, all design features for occupied habitat will be implemented.
45. No prescribed burning or mechanical treatments (mowing) will occur.

#### Other Rare Plants –Region 4 Forest Service Sensitive and HTNF Watch List plants:

46. No mixing and loading of herbicides would occur within occupied habitat for, Sensitive or Watch List plant species to limit the potential for herbicide spills.
47. Broadcast spray (using a truck/UTV mounted sprayers) would not occur within 500 feet of Forest Sensitive or HTNF Watch List plant occurrences unless specific alternative treatment guidelines are established by the Forest or District Botanist.
48. Directed broadcast/spot spray (using a backpack sprayer) would not occur within 100 feet of Forest Sensitive or HTNF Watch List plant occurrences unless specific alternative treatment guidelines are established by the Forest or District Botanist.
49. Herbicide treatments would not occur within 500 feet of Forest Service Sensitive bryophyte occurrences unless specific alternative treatment guidelines are established by the Forest or District Botanist.
50. To protect riparian and wet meadow vegetation communities, herbicide application in riparian corridors and wet meadows would be limited to direct foliar spray or wiping methods and spray will be directed away from native vegetation.
51. Staging areas and fire lines for prescribed burning treatments would not be constructed within known occurrences of Forest Sensitive or HTNF Watch List plant species.
52. When Forest Sensitive or HTNF Watch List plant species are within 25 feet of prescribed burning treatments, plants would be clearly identified and care taken to avoid direct impacts to individuals.
53. When Forest Sensitive or HTNF Watch List plant species are within 25 feet of digging, tarping, or mechanical treatments, plants would be clearly identified and care taken to avoid direct impacts to individuals. No buffers are required for hand pulling.
54. Where determined necessary based on habitat potential, surveys will be conducted for Forest Sensitive and HTNF Watch List plant occurrences within 500 feet of new infestations identified for chemical and biological treatment, and within 25 feet of new infestations identified for manual treatments prior to implementation.
55. Within *riparian plant communities*, surveys would be conducted for Forest Service Sensitive *Botrychium* species prior to any weed treatments. Any new occurrences discovered during these surveys would be clearly identified and avoided during treatment activities.

#### Recreation/Wilderness/Rangeland Resources/Cultural Resources

**Issue:** Weed treatment, particularly herbicide use, could affect visitors to the Forest, those engaging in special uses of the Forest, and tribal uses.

56. Regional Forester approval (through a Minimum Requirements Analysis) will be required if herbicide use is proposed to control an invasive plant infestation in any Wilderness Area (FSM 2320, and Wilderness Management Plans).
57. Regional Forester Approval will be required if herbicide use is proposed to control an invasive plant infestation in a Research Natural Area (Refer to FSM 4060).
58. Herbicide treatments at special use sites, along Forest Service trails, at developed recreation sites and areas of concentrated public use will avoid holidays and will be scheduled to avoid high use periods of the day. Permittees and District Resource or Recreation Managers will be notified prior to treatments so that treatments can be scheduled to minimize conflicts.
59. In areas of high public use, areas treated with herbicides will be flagged and signed to warn the public of treatment activities.
60. The Forest Service will coordinate with the Pacific Crest Trail Association (PCTA) during the annual implementation process if new treatments other than hand pulling are proposed within the viewshed of the Pacific Crest Trail. Temporary interpretive signing would be used (outside of Wilderness) if the trail's viewshed is altered by treatment activities.
61. Cultural resource inventories and evaluations will be conducted on a case by case basis per the Weeds Programmatic Agreement.
62. Permittees and District Resource or Recreation Managers will be notified prior to herbicide treatments so that treatments can be scheduled to minimize conflicts with high use areas or high use time periods.
63. The Districts will continue to consult with Native American tribes and develop management strategies which protect the integrity of traditional cultural plant gathering locations. Herbicides will not be used to treat noxious or invasive weeds in any Area of Concern or gathering site for local Tribes without consulting with the Tribes.
64. Grazing permittees will be notified when treatments are proposed on their active allotments. If more intensive treatments are required on a particular allotment, treatment activities will be discussed with the permittee and included in the Annual Operating Instructions for Grazing Permits.
65. Any need to exclude livestock from treated or revegetated sites within an allotment would be discussed with the permittee in the Annual Operating Instructions meeting, and would be met through herding practices (sheep), or temporary fencing (cattle) constructed by the Forest Service.

## **I. ANALYSIS PROCESS**

*Background Research* – For the purpose of this analysis, aerial photos, soil maps, GIS coverages, and other existing documents were reviewed to determine suitable habitat potential for Forest sensitive and threatened, and endangered species. District and state wildlife databases were examined to identify any known locations or potential habitat that may occur within or adjacent to the project boundary. Recently produced sage grouse and desert bighorn sheep distribution maps were obtained from California Department of Fish and Game and Nevada Department of Wildlife to determine proximity of these species to the project area. In addition, consultation with State biologists was conducted to gain local and

expert knowledge pertaining to potential habitat for sage grouse, bighorn sheep, pygmy rabbit and other species that could potentially occur in the project area.

*ID Team Meetings*-Interdisciplinary team meetings for this project have been ongoing since 2015. Both field and in-office meetings were conducted on numerous occasions to examine field conditions of the project area and discuss specific components of the proposed action. Resource specialists were encouraged to identify and incorporate specific design features into the proposed action to minimize potential impacts.

*Habitat Analysis*-For most species, determining available potential habitat in the project area was based on information from the California Integrated Weed Management Vegetation Report (project record). In this report, vegetation communities in the project area were determined based on the U.S. Forest Service Pacific Southwest Region (USFS PSW) CALVEG Vegetation Classification and Mapping System GIS data (Table 3.). These communities represent different vegetation and habitat types and potentials within the project area. Where specific locations of species were not known, general habitat parameters at a coarse scale were used to estimate potential habitat for each species. For example, acres of mixed conifer habitat within the project area was used as an estimate of habitat potential for the white-headed woodpecker. Forest Service databases and spatial information were also accessed to determine known locations and breeding habitat of special status species analyzed in this report species. Currently mapped noxious weed locations were queried from the Forest Service FACTS database and then overlay with known breeding territories for Forest Sensitive species and MIS, as well as occupied and critical habitat for Threatened and Endangered species. More specific habitat analysis was conducted using Geographical Information Mapping Systems (GIS) to determine noxious and invasive weed occurrences within occupied or potential habitat for Forest Sensitive Wildlife species.

**Table 3.** Primary Vegetation Communities within the California Integrated Weed Management Project area.

| Plant Community       | Weed Risk*       | Acres Managed by the HTNF | Number of Known Infestations | Acres Currently Identified |
|-----------------------|------------------|---------------------------|------------------------------|----------------------------|
| Alpine-Dwarf Shrub    | Low              | 14,004                    | 0                            | 0                          |
| Annual Grassland      | High             | 7,732                     | 27                           | 51                         |
| Aspen                 | Low              | 17,053                    | 4                            | 0.8                        |
| Barrens               | Low to Moderate  | 67,077                    | 13                           | 13                         |
| Bitterbrush           | Moderate         | 46,950                    | 66                           | 208                        |
| Eastside Pine         | Moderate         | 33,967                    | 111                          | 219                        |
| Lodgepole Pine        | Low              | 52,105                    | 6                            | 0.6                        |
| Low Sagebrush         | Low              | 38,199                    | 6                            | 1                          |
| Montane Chaparral     | Moderate         | 50,986                    | 60                           | 440                        |
| Montane Riparian      | High             | 6,856                     | 10                           | 11                         |
| Pinyon-Juniper        | Moderate         | 53,678                    | 12                           | 20                         |
| Subalpine Conifer     | Low              | 39,968                    | 1                            | 0.1                        |
| Sagebrush             | Moderate to High | 174,701                   | 68                           | 80                         |
| Sierran Mixed Conifer | Low to Moderate  | 40,219                    | 35                           | 32                         |
| Wet Meadow            | High             | 8,620                     | 30                           | 99                         |
| White Fir             | Low              | 12,003                    | 1                            | 0.1                        |

Source: USFS PSW CALVEG Classification and Mapping System GIS data.

**\*Risk criteria:** **Low** - few or no weeds present; few vectors; previous disturbance low; high canopy cover.

**Moderate** - weeds present; moderate expansion potential; canopy cover & previous disturbance moderate.

**High** - heavy infestations and/or aggressive weeds present; probable expansion in absence of treatment; abundant vectors; low canopy cover; previous disturbance high.

#### IV. CURRENT MANAGEMENT DIRECTION

Current management direction on desired future conditions for Sensitive, Threatened and Endangered species on the Humboldt – Toiyabe National Forest can be found in the following documents, filed at the Carson Ranger District:

- Forest Service Manual and Handbooks (FSM/H 2670)
- National Forest Management Act (NFMA)
- Endangered Species Act (ESA)
- National Environmental Policy Act (NEPA)
- Toiyabe National Forest Land and Resource Management Plan (USDA 1986)
- Sierra Nevada Forest Plan Amendment 2001, 2004 (USDA 2001, 2004)
- Intermountain Region (R4) Sensitive Species List (USDA 2011)

#### VI. SPECIES EVALUATED FOR BIOLOGICAL ASSESSMENT

A Biological Assessment (BA) was prepared to analyze the potential effects of the project on Threatened, Endangered, and Proposed species. The BA was prepared as a separate document from the BE and includes analysis of the following species: Lahontan cutthroat trout (*Threatened*), Paiute cutthroat trout (*Threatened*), Sierra Nevada yellow-legged frog (*Endangered*), Yosemite toad (*Threatened*), Sierra Nevada bighorn sheep (*Endangered*), and Webber ivesia (*Threatened*). The BA is located in the project record.

#### VII. SPECIES EVALUATED IN THE BIOLOGICAL EVALUATION

The below list includes the United States Department of Agriculture Forest Service Regional Forester's (R4) sensitive species (Accessed November 2017

([https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5370041.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5370041.pdf)).

##### BIRDS

- Northern goshawk (*Accipiter gentilis*)**
- Sage grouse (*Centrocercus urophasianus*)**
- \*Yellow-billed cuckoo (*Coccyzus americanus*)
- Peregrine Falcon (*Falco peregrinus anatum*)**
- Bald Eagle (*Haliaeetus leucocephalus*)**
- Flammulated owl (*Otus flammeoulus*)**
- Mountain quail (*Oerortyx pictus*)**
- White-headed woodpecker (*Picoides alborlarvatus*)**
- \*Three-toed woodpecker (*Picoides tridactylus*)
- California spotted owl (*Strix occidentalis occidentalis*)**
- Great gray owl (*Strix nebulosa*)**

##### MAMMALS

- Pygmy rabbit (*Brachylagus idahoensis*)**
- Townsend's big-eared bat (*Corynorhinus townsendii*)**
- Spotted bat (*Euderma maculatum*)**
- North American wolverine (*Gulo gulo luteus*)**
- Bighorn sheep (*Ovis Canadensis spp.*)**
- Sierra Nevada red fox (*Vulpes vulpes necator*)**

## INSECTS

- \*Spring Mountain checkerspot (*Chlosyne acastus robusta*)
- \*Ancilla blue (?) (*Euphilotes ancilla purpura*)
- \*Morands checkerspot (*Euphydryas anicia morandi*)
- \*Mt. Charleston blue butterfly (*Icaricia shasta charlestonensis*)

*The wildlife species listed above are designated as sensitive by the United States Department of Agriculture Forest Service Regional Forester and are known to occur on the Humboldt-Toiyabe National Forest (Region 4; USDA 2018). Those species known to occur, or have the potential to occur within the Carson and Bridgeport Ranger Districts, are shown in bold, and will be analyzed to determine direct, indirect, or cumulative effects to populations, and if project activities may impact viability leading to federal listing of those species. Species marked with (\*) are not known to occur on the Carson or Bridgeport Ranger Districts, therefore there will be **no direct, indirect, or cumulative impacts** to these species from the proposed project and no further analysis will be conducted.*

## VIII. ANALYSIS PROCESS

### **Analysis Area for Direct, Indirect, and Cumulative Effects**

According to the Council on Environmental Quality (CEQ) National Environmental Protection Act (NEPA) regulations, “cumulative impact” is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable (but not speculative) future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions (40 CFR 1508.7).

The CEQ issued an interpretive memorandum on June 24, 2005, regarding analysis of past actions, which states, “agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions.” In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

Past management and development activity has played a role in the degradation of habitats within the Sierra Nevada and in the project area. Human activities within these habitats include grazing, timber harvest, fuels management, recreation, and water development. Loss or alteration of suitable breeding habitat can reduce reproductive success, which may have a profound impact when population numbers are small. The design features, implemented as part of the proposed action limit activities and the use of herbicides in occupied habitat reducing potential direct and indirect effects to wildlife species from the proposed action. Treating noxious and invasive species in these sensitive environments and using the control methods prescribed, will, over time improve the habitat by removing the threat of noxious weed infestation and expansion. The incremental short term impacts to habitat from implementation of the proposed action when combined with past actions does not result in an adverse long term loss of habitat because the long term benefits of treatment and removal of noxious and invasive weed species improves degraded habitat. Reasonably foreseeable future actions will not result in habitat degradation because they will be required to avoid adverse impacts to habitat and mitigate short-term impacts when they cannot be avoided.

Unless otherwise state below, the analysis area to determine potential direct and indirect effects of the alternatives encompasses the entire project area, all Humboldt-Toiyabe National Forest system lands that

occur in California. The cumulative effects area for this project also includes where pertinent, adjacent public and private lands outside of its boundaries.

## **IX. SPECIES ACCOUNTS, EFFECTS ANALYSIS, AND DETERMINATIONS**

### **General Effects to Wildlife from Treatment Activities Associated with the Proposed Action**

The Proposed Action has the potential to affect terrestrial wildlife through the following:

- Disturbance of individuals from noise or visual disturbance associated with treatments;
- Secondary effects upon habitat
- Toxicity from acute or chronic exposure to herbicides

#### **Disturbance or Displacement**

Under the proposed action, all of the treatment methods have the potential to cause some level of disturbance and or temporary displacement to wildlife. The most common treatment methods that will be used in the project area include manual (hand digging, pulling, clipping and bagging) herbicide application, and biological (insects and targeted grazing) treatments. In general, treatments using manual and herbicide methods will not exceed more than a few days and will be conducted by crews no larger than 4 individuals. Manual treatments generally include crews walking into a treatment site, carrying hand tools and no motorized equipment is involved. Herbicide treatments are also conducted by crews walking and carrying backpack sprayers but treatments can also include the use of motorized equipment such as one or two UTVs or spray trucks. Because manual techniques are slower than herbicide methods, the duration of disturbance, caused by the presence of people, may be longer in the treatment area but generally still no longer than a few days. The presence of crews during treatments may generate noise sufficient to flush birds from a nest or interfere with feeding of nestlings if conducted in proximity to nests. Other wildlife such as bighorn sheep may avoid treatment areas while weed crews are in the area.

Biological treatments using targeted grazing have the potential to be the longest of the treatment methods. Depending on the level of infestation livestock could be in a treatment area for several weeks. The presence of livestock may deter some wildlife species from utilizing the area during the entire duration of the treatment. Other species would likely only be disrupted for a day or two before adjusting to the presence of livestock and returning to the area. Under the proposed action, targeted grazing using domestic sheep would not be used in areas where wild sheep are known to occur.

Other less used treatment methods under the proposed action including mowing and prescribed burning. Both of these activities have the potential to displace wildlife for longer periods of time while vegetation conditions recover. However, both of these techniques are generally only used when an infestation has become a contiguous monoculture of noxious and/or invasive weeds. Monocultures are comprised of single species, non-native plants that generally provide very little value to most wildlife species. Therefore, treatments in these areas would result in disturbance to very few wildlife species. Within the project area, the majority of weeds occur as small isolated patches and not contiguous infestations. Therefore it is unlikely that mowing and or prescribed burning will be applied with any frequency.

Effects to nocturnal species analyzed in this report such as the flammulated owl and the California spotted owl, will be minimal as weed crews would only be conducting treatments during the day. During the Annual Implementation Process, the District Weed Manager will coordinate with the District Wildlife

Biologist to be made aware of any sensitive areas (such as active nest sites, rare amphibian breeding areas) so that disturbance can potentially be avoided during critical time periods.

### **Habitat Alteration**

Invasive plant treatment methods described in the Proposed Action, can result in short term effects to habitat. Due to the small and patchy nature of most of invasive plant infestations on the HTNF however, the amount of cover lost would not have any measurable effect on wildlife populations. Where invasive plants occur in large, dense patches, treatments can temporarily create bare ground by reducing plant cover. The removal of invasive plants can, in the short-term, decrease the amount of vegetative cover available to wildlife. This could be particularly true in areas treated by prescribed burning where the goal is to remove the majority of the vegetation within the infestation. While the vegetation is recovering, which could occur over a period of one to five years, the area would likely provide limited value to wildlife. However, removal of invasive plants generally increases the diversity of native herbaceous and shrub species within treated areas. For the most part, invasive plant treatments restore, rather than reduce, habitat available to wildlife and the successful control of invasive plant infestations provides long-term benefits by restoring and preventing further loss of native habitat.

Treatments using biological control agents such as targeted grazing and insects pose little risk to wildlife species or their habitat. In targeted grazing, the kind of animals and amount and duration of grazing are specifically designed to help control a particular species of plant while minimizing the impacts on perennial native vegetation that is needed to help reduce the likelihood of reinvasion by undesirable plant species. While some inadvertent consumption and/or trampling of native vegetation may occur during targeted grazing, the amount consumed is minimal due to the tightly controlled management of these livestock. Insects used to treat noxious weeds are host specific and would not impact native plant species. Under the Proposed Action, only biological control agents that are permitted for release by the USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) will be used. Before being permitted by APHIS and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018). By utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal.

### **Herbicide Toxicity**

The use of herbicides has the potential to affect wildlife through acute or chronic exposure. The effects of herbicide use depend on the toxicity of the herbicide, the level of exposure to that herbicide, and the duration of that exposure. Risk assessments evaluate the potential effects to non-target plants, wildlife, human health, soils, and aquatic organisms from the herbicides considered for use within the project area. The Forest Service contracted with Syracuse Environmental Research Associates, Inc (SERA) to evaluate human health and ecological effects of herbicides using EPA studies and other peer-reviewed articles from the open scientific literature. Information from laboratory and field studies of herbicide toxicity, exposure, and environmental fate was used to estimate the risk of adverse effects to non-target terrestrial and aquatic organisms, humans, water, and soil. Table 6 identifies the risk assessments available by active ingredient; these may be accessed online at: <http://www.fs.fed.us/foresthealth/pesticide/risk.shtml>.

**Table 6. Risk Assessments for herbicides analyzed**

| Herbicide (Active Ingredient)       | Date Final                   | Risk Assessment Reference  |
|-------------------------------------|------------------------------|--|
| Aminopyralid                        | June 8, 2007                 | SERA TR-052-04-04a   |
| Chlorsulfuron                       | November 21, 2004            | SERA TR 04-43-18-01c   |
| Glyphosate                          | March 25, 2011               | SERA TR-052-22-03b   |
| Imazapyr                            | December 16, 2011            | SERA TR-052-29-03a   |
| Rimsulfuron                         | March 2014 (Created for BLM) | AECOM 2014-FS assessment under Development (rimsulfuron will not be used until the SERA report is completed) |
| Sulfometuron methyl                 | December 14, 2004            | SERA TR 03-43-17-02c   |
| Triclopyr: triethylamine salt (TEA) | May 24, 2011                 | SERA TR-052-25-03a   |

In addition to the analysis of potential hazards to wildlife from the active ingredients in the herbicides, SERA Risk Assessments evaluated available scientific studies of potential hazards of other substances associated with herbicide applications: impurities, metabolites, inert ingredients, and adjuvants. There is usually less toxicity data available for these substances (compared to the herbicide active ingredient) because they are not subject to the extensive testing that is required for the herbicide active ingredients.

Risk assessments are a qualitative evaluation of the probability that the use of an herbicide may pose a risk to human health or the environment (FSM 2150.5). The risk assessments contain:

- Hazard Characterization - What are the dangers inherent with the active ingredient?
- Exposure Assessment- Who could come into contact and how much?
- Dose Response Assessment - How much is too much?
- Risk Characterization - Indicates whether or not there is a plausible basis for concern.

The risk assessments considered worst-case scenarios including accidental exposures and application at maximum label rates. Although the risk assessments have limitations, they represent the best science available. The risk assessment methodologies and detailed analysis is incorporated into references of conclusions about herbicide toxicology in this document.

### **Herbicide Toxicology Terminology**

The following terminology is used throughout this document to describe relative toxicity of herbicides proposed for use in the alternatives

**Threshold of Concern:** A level of exposure below which there is a low potential for adverse effects to an organism. Effects on wildlife and other organisms are considered insignificant and discountable when herbicide exposure is below the threshold of concern.

**Hazard Quotient (HQ):** A "toxicity threshold" was established for each herbicide to indicate the point below which adverse effects would not be expected for a variety of organisms (e.g. people, wildlife, fish). The predicted level of exposure from herbicide use is compared to the toxicity threshold and expressed in terms of a "hazard quotient (HQ)." The Hazard Quotient is the amount of herbicide or additives to which an organism may be exposed over a specified period, divided by that estimated daily exposure level at which no adverse health effects are likely to occur. An HQ less than or equal to one indicates an

extremely low level of risk. Toxicity thresholds are based on extrapolated laboratory results and accepted scientific protocols. The probability of harmful effects increases with HQ.

**Level of Concern (LOC):** An estimate of exposure above which there may be adverse effects; in risk assessments this is defined as a HQ of more than one.

**No Observable Adverse Effects Level (NOAEL)-** Where research has shown no statistically significant effect when compared to animals not exposed to the chemical. Thus hazard quotients (HQ) of less than 1.0 indicate that the exposure poses little reason for concern. Hazard quotients greater than 1.0 pose concern for effects to wildlife.

**Exposure Scenario:** For each ecological risk assessment, a set of general exposure scenarios based on the low, typical, and maximum label rates of the herbicides are analyzed. For wildlife, exposure scenarios included the animal being directly sprayed; ingestion of contaminated vegetation, prey species, or water; grooming activities; and indirect contact with contaminated vegetation.

The application rate and method influences the amount of herbicide to which an organism may be exposed. Analysis of effects to wildlife from herbicides and the associated surfactants or dyes proposed for use in this project, utilizes risk assessments based upon Human Health and Ecological Risk Assessment reports prepared by Syracuse Environmental Research Associates (SERA 2007, 2004a, 2011a, 2011b, 2004b, 2011c) which utilize the best available science to describe the level of herbicide expected to be introduced, persist, and transport within the forest environment, and to evaluate the likelihood of adverse ecological effects. Only herbicides that have SERA risk assessments and approved Pesticide Use proposals are proposed in this action, with the exception of one chemical, rimsulfuron. The Forest Service is in the process of developing a Pesticide Use Proposal and risk assessment for rimsulfuron. Once a USFS Pesticide Use Proposal is completed, the HTNF will no longer use sulfometuron-methyl and will replace it with rimsulfuron for the treatment of annual grasses. Although there is no current SERA report for rimsulfuron, the Bureau of Land Management (BLM) completed a similar risk assessment for this chemical in 2014 (AECOM 2014). The BLM uses similar application methods for similar treatments as the Forest Service, so for the purposes of this human health assessment, we considered the BLM risk assessment the best available science for rimsulfuron.

FS/SERA risk assessments use peer-reviewed articles from the open scientific literature and current EPA documents. The likelihood that an animal will experience adverse effects from an herbicide depends on: (1) toxicity of the chemical, (2) the amount of chemical to which an animal is exposed, (3) the amount of chemical actually received by the animal (dose), and (4) the inherent sensitivity of the animal to the chemical, all of which are evaluated in FS/SERA risk assessments. Most of the Risk Assessments do not provide specific information for specific species so wildlife species were placed into groups based on taxa type (e.g. bird, mammal), with similar body size and diet.

When enough data was available for a particular type of animal, an exposure scenario was developed, and a quantitative estimate of dose received by the animal type in the scenario was calculated as described in the SERA risk assessments. The quantitative estimates of dose were compared to available toxicity data to determine potential adverse impacts. Because of the uncertainty with regard to how accurately a surrogate species may represent other wildlife, the FS/SERA risk assessments use the most sensitive endpoint from the most sensitive species tested as the toxicity index for all wildlife. The estimated dose (from the scenarios) is divided by the “toxicity index” and the result is known as the Hazard Quotient. When the

Hazard Quotient is less than 1.0, the dose is less than the toxicity index. Potential effects from doses calculated to be below the toxicity indices are discountable. When a calculated dose was greater than the toxicity index, there is a potential for adverse effects. This very protective approach constitutes a “worst-case” analysis for potential effects of herbicides.

Terrestrial animals might be exposed to any applied herbicide from direct spray, the ingestion of contaminated media (vegetation, prey species, or water), grooming activities, or indirect contact with contaminated vegetation, and these sources of exposure were considered in the risk assessments used for this analysis. As discussed above, the threshold of concern is the no observable adverse effect level (NOAEL), where research has shown no statistically significant effect when compared to animals not exposed to the chemical. Thus hazard quotients (HQ) of less than 1.0 indicate that the exposure poses little reason for concern. Hazard quotients greater than 1.0 pose concern for effects to wildlife. Risk assessments show that the highest exposures for terrestrial vertebrates would occur after the consumption of contaminated vegetation or contaminated prey. Other routes of exposure, including direct spray, dermal contact with contaminated vegetation, ingestion of contaminated water, or the consumption of contaminated fish, lead to levels of exposure considerably below the level of concern for all species groups and all herbicides being considered in this project. Thus, the following discussion focuses on acute and chronic herbicide exposures resulting from ingestion or exposure to contaminated vegetation or prey, for the herbicides included in the Proposed Action.

**Mammals:** Review of exposure scenarios and risk characterizations for glyphosate, aminopyralid, imazapyr, chlorsulfuron, rimsulfuron, and sulfometuron-methyl, indicate that for both acute and chronic exposures, hazard quotients are below the threshold of concern, 1.0, in all exposure scenarios. The assessments included consideration of accidental acute exposure (from direct spray, or contamination following a spill), non-accidental acute exposures (from contaminated vegetation, water, or consumption of contaminated insects or small mammals), and from chronic/longer term exposures associated with consumption of contaminated vegetation, water, or fish). The weight of evidence from available studies suggests that no adverse effects to mammals are plausible using typical or worst-case exposure assumptions at application rates proposed in this project. Hazard quotients for all exposure scenarios, at both the central and upper range, are well below one (the level where potential effects from doses are considered discountable). This indicates there is a low level of concern that application of these herbicides in the California Integrated Weed Management project would adversely affect mammals.

Review of the risk characterization for triclopyr, however, indicates that HQs exceed the level of concern ( $HQ > 1$ ) for exposures to mammals involving the consumption of contaminated vegetation. The HQs for mammals increase as body weight increases. While small mammals may consume more than larger animals, the higher sensitivity of larger mammals to triclopyr suggest they are at greater risk. The high hazard quotients particularly for large mammals under chronic exposure to contaminated vegetation, suggest the potential for adverse effects. The “worst case” exposure scenarios do not, however, account for factors such as timing and method of application, animal behavior and feeding strategies and/or implementation of project design criteria. When these factors are considered, it is evident that risk is overestimated for both the acute and chronic exposure scenarios relative to the Proposed Action.

Under the acute exposure scenario, the environmental risk model assumes that 100 percent of the animal’s diet is made up of contaminated vegetation within a 24-hour period. Under the chronic exposure scenario, it is assumed that 30 percent of an animal’s diet will come from treated vegetation over a 90-day period.

Since treated plants will rapidly brown and die, they will not remain palatable or available as forage for more than about five to ten days following treatments, making the acute or the chronic scenario implausible. Furthermore, triclopyr would be used only on rare occasions to potentially treat salt cedar tamarisk, which currently occurs in the project area in very limited numbers as individual isolated shrubs. Herbicide treatments therefore would be conducted using targeted applications such as wick and wiping which would minimize potential drift and subsequent exposure to herbivorous mammals. For these reasons, the magnitude of risk for mammals consuming vegetation treated with triclopyr under the Proposed Action is considerably less than the risk characterization provided in the SERA risk assessments.

In addition, the quantitative risk characterization must be tempered by information from field applications of triclopyr. None of the available field studies of wildlife report adverse effects which might be attributed to the toxicity of triclopyr. This may be because the upper bound HQs represent multiple worst case exposure assumptions that may not occur frequently in the field. Another likelihood is that many mammals, such as deer, are likely to avoid treated areas. If larger mammals avoid treated areas, the proportion of the contaminated diet could be much less than 100 percent and as the proportion of the diet that is contaminated decreases, the HQs will also decrease. Under the Proposed Action, triclopyr will only be used in limited situations, primarily to treat woody species such as salt cedar tamarisk (currently there are only a few known tamarisk plants within the project area). Triclopyr will be applied using direct application methods such as wick and wipe on individual plants or cut-stump application which will minimize the risk of non-target exposure and accidental drift.

**Birds:** Review of exposure scenarios and risk characterizations for glyphosate, aminopyralid, imazapyr, chlorsulfuron, rimsulfuron, and sulfometuron-methyl, indicate that there are no toxicity effects anticipated in birds. This was true for scenarios involving direct spray, consumption of contaminated vegetation, contaminated insects, or contaminated prey. For triclopyr, scenarios involving consumption of contaminated vegetation or contaminated insects by a small bird (10 g) resulted in HQs that exceeded one for both acute and chronic exposures at the central and upper bounds. As described for mammals, however, the limited use of triclopyr under the proposed action, minimizes the exposure of birds to vegetation or insects treated with triclopyr over any length of time. Birds are very unlikely to consume 100 percent of their diet in contaminated vegetation or insects over a 24 hour period, and the chronic exposure scenarios (30 percent of the diet over a 90- day period) would be even less plausible, since treated vegetation will brown and die. All exposure scenarios for a large bird, such as an eagle, are below the threshold of concern. Under the Proposed Action, triclopyr will only be used in limited situations, primarily to treat woody species such as salt cedar tamarisk (currently there are only a few known tamarisk plants within the project area). Triclopyr will be applied using direct application methods such as wick and wipe on individual plants or cut-stump application which will minimize the risk of non-target exposure and accidental drift.

**Invertebrates:** Review of exposure scenarios and risk characterizations for aminopyralid, imazapyr, chlorsulfuron, rimsulfuron, and sulfometuron-methyl indicate that adverse effects in invertebrates due to herbicide toxicity are unlikely. Based on available information there is no indication that adverse effects on terrestrial invertebrates would occur. As with mammals and birds, the risk characterization for terrestrial invertebrates is based on data covering very few species relative to the large number of terrestrial invertebrates that might be exposed to these chemicals.

The upper bound HQs for glyphosate reach or slightly exceed one (HQ=1.8) for terrestrial invertebrates consuming small insects or vegetation. This raises concerns that moderate to high application rates of glyphosate could have an adverse impact on some terrestrial invertebrates. (It should be noted that these risk quotients were based on the more toxic formulation of glyphosate that includes a surfactant; HQs were not calculated for the less toxic aquatic formulation of glyphosate being used in this project). The available field studies on terrestrial invertebrates do not, for the most part, reinforce a concern. Most field studies suggest that effects on terrestrial invertebrates will be minimal and secondary to changes in vegetation. Furthermore, under the proposed action, only the aquatic formulation of glyphosate will be used which does not have a premixed surfactant and is considered less toxic than non-aquatic formulations (USDA 1997, Folmar 1979). Glyphosate will not be used in an area larger than one contiguous acre, and will likely almost always be used to treat much smaller areas.

Similar to glyphosate, the upper bound HQs for triclopyr slightly exceed one (HQ=1.3) for terrestrial invertebrates consuming vegetation. For triclopyr, there is a reasonably extensive group of field studies indicating that effects on terrestrial invertebrates are most likely to be associated with changes in habitat and food availability rather than herbicide toxicity. The risk characterization for insects is therefore based primarily on the field studies rather than the HQs and does not indicate that adverse effects are likely. Similar to the risk characterization for mammals, only the dietary HQs approach a level of concern for terrestrial invertebrates. Under the Proposed Action, triclopyr will only be used in limited situations, primarily to treat woody species such as salt cedar tamarisk (currently there are only a few known tamarisk plants within the project area). Triclopyr will be applied using direct application methods such as wick and wipe on individual plants or cut-stump application which will minimize the risk of non-target exposure and accidental drift.

**Aquatic Wildlife:** When herbicides are used within and near aquatic habitats, they must contain a specific label that has been approved by the Federal Environmental Protection Agency (EPA) and the California Department of Pesticide Regulation (DPR) for aquatic use. These herbicides have different formulations than those used in upland plant communities and are considered safe to most aquatic organisms when label directions are followed. Only herbicides that have been approved for use in the state of California and have a label certifying that the chemical has been approved for use by the EPA and the DPR, would be used in the California Integrated Weed Management Project area. A full discussion of risk from individual herbicides to aquatic species are presented in the Biological Assessment for this project (USDA 2017)

A review of risk assessments for aquatic species shows that most of the concern for aquatic species is associated with exposures scenarios for an accidental spill. These scenarios were above a threshold of concern for hazards to aquatic plants and algae. Glyphosate was the only herbicide where an accidental spill scenario exceeded a threshold of concern for fish, amphibian, or invertebrate species. While the risk of accidental spill cannot be completely eliminated, Project design features (DF) preventing herbicide mixing and loading within 300 feet of water have been included in the Proposed Action, and will limit the potential for a spill to enter water and impact aquatic plants or algae. Additional DFs requiring a project spill plan and the use of spill kits further limit potential impacts to aquatic resources if a spill were to occur. Finally, it should be noted that SERA risk assessments are likely to overestimate hazards from a spill relative to activities in the Proposed Action. Under the proposed action, only the aquatic formulation of glyphosate will be used which does not have a premixed surfactant and is considered to be virtually

non-toxic to aquatic organisms (USDA 1997, Folmar 1979). Glyphosate will not be used in an area larger than one contiguous acre, and will likely almost always be used to treat much smaller areas.

Hazard quotients for triclopyr and chlorsulfuron were also above a threshold of concern for either chronic or acute exposure scenarios relative to effects to algae or aquatic plants (Williams 2012). Reduction of algae or aquatic plants can indirectly impact food and cover resources for aquatic wildlife. For these herbicides aquatic buffers that exceed label requirements were established to avoid herbicide entry into aquatic habitats. These aquatic buffers, as well as design features preventing herbicide treatments during wet weather conditions and design features avoiding herbicide preparation within RCAs, are expected to prevent movement of herbicides into aquatic habitat through surface runoff. Additional layers of precaution have been applied where there are known occurrences of Endangered, Threatened or Sensitive aquatic species, as described in the following section.

### **Surfactants**

The Proposed Action describes use of methylated seed oil, such as Hasten or Competitor, as a surfactant that may be used with any of the herbicides. Its primary ingredient is ethylated canola oil, which is considered food grade. Polyoxyethylene dialkylester and Sorbitan alkylethoxylate ester are other active ingredients (Bakke 2007). Two carcinogenic impurities are known to be in the surfactant: ethylene oxide and 1,4 dioxane. Manufacture labels recommend using 0.25-1% surfactant mixed with the herbicide. Other than ethylated canola oil, the chemicals in the surfactant have received very little study and scrutiny to determine what affect the chemicals may have. Overall the hasten/competitor surfactant appears to have a lower level of toxicity than the herbicides and is used in small quantity compared to the herbicide, and thus appears to have little concern for wildlife, except for the uncertainty concerning some of the chemicals and carcinogen effects of the impurities in hasten/competitor.

Adjuvants Highlight blue is the only adjuvant proposed for use. It is a colorant that makes the herbicide more visible during application. Actual ingredients are unknown but are identified as minimal risk inert ingredients or as inerts of unknown toxicity by the EPA (Bakke, 2007). Highlight blue is considered virtually non-toxic to humans, and there is no evidence indicating toxicity to wildlife.

## **A. FOREST SENSITIVE WILDLIFE SPECIES**

### **NORTHERN GOSHAWK**

***Range, Distribution, and Status:*** Northern goshawks have a holarctic distribution breeding from boreal Alaska and Canada south in to the East as far as Pennsylvania and New York and in the West to the mountains of southern Arizona and New Mexico (Squires and Kennedy 2006). Nesting distribution on the Carson District ranges from north of Reno in the Dog Valley area, south to Spooner Summit and Genoa Peak and southwest throughout Alpine County including the Carson Iceberg Wilderness. Goshawks are listed as a Forest Sensitive species throughout the Intermountain Region (Region 4).

***Habitat Requirements and Natural History:*** Northern goshawks are typically associated with late seral or old growth forests, characterized by contiguous stands of large trees and large snags with closed canopies (53 to 100%) and relatively open understory (Reynolds et al. 1992, Hayward and Escano 1989). On the Carson and Bridgeport Ranger Districts, known goshawk nest sites are found in large aspens and conifers

with an approximate average canopy cover of 55% to 78 % (unpublished field data, on file Carson Ranger District). Within the Sierra Nevada, northern goshawks breed from approximately 2,500 feet in ponderosa pine vegetation type through approximately 10,000 feet in the red fir and lodgepole pine vegetation types, and throughout eastside pine forests on the east slope. Foraging habitat requirements for goshawks are less understood than nesting habitat (Squires and Kennedy 2006). Results from some studies suggest goshawks forage in all forest types, but appear to select forests with a high density of large trees, greater canopy cover, high basal area and relatively open understories in which to hunt (Beier and Drennan 1997).

Foraging habitat requirements for goshawks are less understood than nesting habitat (Squires and Kennedy 2006). Results from some studies suggest goshawks forage in all forest types, but appear to select forests with a high density of large trees, greater canopy cover, high basal area and relatively open understories in which to hunt (Beier and Drennan 1997). Northern goshawks prey on over 50 species of birds and mammals throughout their western range (Graham et. al. 1994). In the Sierra Nevada region, primary prey species include Douglas squirrel (*Tamiasciurus douglasii*), Steller's jay (*Cyanocitta stelleri*), northern flicker (*Colaptes auratus*), and ground squirrel (*Spermophilus* spp.).

Goshawks begin courtship and nest building during February and March with egg-laying usually occurring the beginning of April (Woodbridge 1992). Goshawks tend to have a lower disturbance threshold during this period and may readily abandon nests when disturbed by humans (Woodford 2008). The nesting cycle is usually complete by late-August or mid-September when juveniles are flying and foraging independently. Typical goshawk breeding areas contain several alternative nests that are used over several years (Woodbridge and Deitrich 1994). Alternative nests can be clumped in one to three nest stands or widely distributed throughout the bird's home range (Squires and Kennedy 2006).

**Potential for Occurrence:** The Carson and Bridgeport Ranger District conducts annual surveys for goshawks following the Region 5 Protocol: Survey Methodology for Northern Goshawks in The Pacific Southwest Region (USDA 2000). In accordance with Standards and Guidelines from the Sierra Nevada Forest Plan Amendment, Protected Activity Centers (PACs) are designated for each active nest site detected (USDA 2001 ROD ppA-3; USDA 2004 ROD pp38). PACs include 200 acres of suitable habitat related to the nest site and are managed uniquely to protect goshawk nesting territories from disturbance. Within the project area, there are currently 15 northern goshawk PACS; six on the Bridgeport Ranger District and nine on the Carson Ranger District, totaling approximately 3,644 acres. Of these 15 PACs, only one is known to have noxious weeds, a 0.9 acre infestation of musk thistle.

**Threats:** The major threats to goshawks include loss of critical nesting and foraging habitat from land management practices i.e. logging, livestock grazing, etc) and other natural events (fire, wind storms etc) (Reynolds et al, 1982). Human disturbance is another factor that may impact nesting success and subsequent viability if the disturbance occurs during the critical egg-laying period (April-May).

### **Environmental Consequences**

Under the proposed action, only minor and short term (less than one day) impacts to northern goshawks will occur. Late seral forest habitat types associated with northern goshawks are generally not conducive to large infestations of noxious and/or invasive weed species. Of the 15 goshawk PACS that occur within the project area, only one PAC has a known occurrences of noxious weeds. This occurrence is less than .10 acre and consists of scattered individual musk thistle plants.

## Direct and Indirect Impacts

*Manual and Herbicide Treatments:* Weed treatment occurring with goshawk I PACs could result in some disturbance to roosting, foraging, or nesting goshawks. However, under the proposed action (Design Feature #29), treatment sites within active nesting areas would be avoided until after the critical nesting period. Human disturbance to non-nesting goshawks from weed treatments may cause these species to be displaced or disrupt foraging activities. However, this disturbance would be temporary, lasting only the day (or less) and would not result in any measurable impacts to the viability of individuals or the population. There will be no direct or indirect impact to northern goshawks from the use of herbicides. SERA risk assessments were reviewed and indicate that at proposed application rates, the estimated doses from the exposure scenarios are all less than the reported NOAEL (no-observable adverse effect level) for all herbicides. There are no acute or chronic exposure scenarios at application rates described in the Proposed Action that will result in a Hazard Quotient (HQ) above one for carnivorous birds, such as the goshawk. Herbicides and surfactants applied as described in the Proposed Action pose no risk to these species. Chronic exposures are also unlikely because goshawk prey are not known to prefer foraging on invasive plant species. This reduces the likelihood of chronic exposure since treatments are focused on the invasive plants and prey species are unlikely to consume these plants.

*Biological Control Methods:* It is unlikely biological controls would be used in the late seral mixed conifer habitat associated with northern goshawks due to the relatively small occurrences of noxious weeds. However, a major disturbance such as wildfire may result in some localized expansions of noxious weeds where targeted grazing and or the use of biological control insects may be determined to be appropriate.

Targeted grazing: Targeted grazing may result in some disturbance and temporary displacement of northern goshawks. However, for the purposes of weed control, livestock are expected to sweep through the treatment area, rather than congregate in one place for an extended period, which would limit potential long term, permanent impacts from disturbance associated with grazing. Overtime, any short term impacts to goshawks would be offset by overall improved habitat conditions for the species by reducing noxious weed populations.

Insects: If biological controls are determined to be an appropriate treatment method, there will be no measurable effects to goshawks or their habitat. Under the Proposed Action, only biological control agents that are permitted for release by the USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) will be used. Before being permitted by APHIS and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018). By utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal.

*Mechanical and Prescribed Burning:* Because of the small isolated noxious weed populations that occur in northern goshawk habitat within the project area, mechanical and prescribed burning treatments would likely not be used. Additionally, mechanical treatments such as mowing are generally not a practical treatment method in late seral conifer stands. The occasional use of hand held string trimmers, which may be needed for denser patches of noxious weeds, may result in minor noise related disturbance to

individual goshawks. However the disturbance would be short term (less than one day) and not cause any long term impacts to this species.

In the rare circumstance that prescribed burning would be used as a treatment method, burns would be conducted in small acre increments of no more than 20 acres to assure careful control of intensity and size. Monitoring of burned sites would continue for several years to determine if follow-up treatments are necessary. A site specific burn plan, and close consultation and coordination with a fuels specialist and other resource specialists, would be completed before any prescribed burning activities occurred. The burn plan would specify burning conditions necessary to minimize the threat of escaped fire from occurring. Under the proposed action, active nesting territories would be avoided for treatment until after the critical breeding period for this species. Individual goshawks that may occur in areas adjacent to treatment sites may be temporarily impacted from disturbance associated with treatment equipment (vehicles, crews). Goshawks may be flushed from the site and avoid the area while treatments are occurring. Goshawks may also be vulnerable to impacts from heat and smoke associated with prescribed burns. However, because prescribed burns will not occur in active nesting territories and will be carried out as low intensity burns in small increments, direct impacts to goshawks will be minor and short term (one to two days)

There will be no negative impacts to habitat for goshawks under the proposed action. The treatment of these noxious and invasive weeds will be a negligible loss to existing habitat and will not impact any life requisites for this species. Over the long term, control and eradication of noxious weeds in goshawk habitat will help maintain quality habitat for these species.

**Cumulative Impacts:** For the purpose of this analysis, cumulative impacts include those that have the potential to impact or have impacted the Protected Activity Centers (PACS) within the project area in the past, present or foreseeable future. The largest threat to northern goshawks is loss of late seral conifer habitat. Both of these species rely on densely forested stands that are composed of mixed age trees with multiple canopy layers. Along the Sierra front and particularly on the Carson Ranger District, fuels reduction projects in or near suitable habitat for goshawks has likely resulted in some disturbance to individual goshawks, and in some areas resulted in a reduced availability of quality habitat. However, survey protocols and design features associated with these projects were incorporated to minimize direct and indirect impacts and to the species and provide protection for critical nesting and foraging habitat. Treatment of noxious weeds in habitat for goshawk will over the long term help protect and maintain habitat quality for this species. Although current weed infestations in late seral conifer habitat type is rare, being quick to eliminate and control weeds will assure that infestations do not get larger and that native plant communities are protected. If left untreated, a type conversion of native plants to non-native noxious weeds would over time potentially affect the foraging availability of the northern goshawk primarily by diminishing habitat quality for their prey.

**Determination:** Under the proposed action, there may be minor impacts to northern goshawks due to disturbance during treatment activities. If weed treatments are required within an active nesting territory, treatment activities will not occur until after the critical nesting period is over. Therefore, it is my determination that the proposed action **may impact individual northern goshawks but will not result in a trend toward federal listing or a loss of viability.**

## **GREATER SAGE GROUSE-BI STATE DISTINCT POPULATION SEGMENT**

**Range, Distribution, and Status:** Greater sage-grouse on the Bridgeport and Carson Ranger Districts are part of a distinct population segment (DPS) of sage grouse known as the ‘Bi-State DPS’. The Bi-State population are the only sage grouse population found within the project area. The Bi-state population was proposed for listing as threatened by the U.S. Fish and Wildlife Service (USFWS) in October 2013. In May of 2015, the USFWS withdrew the proposed rule to list the Bi-State DPS of greater sage-grouse as threatened, as well as the proposed rule to designate critical habitat. In 2016, the Forest Service amended the 1986 Toiyabe Forest and Land Management Plan to include standards and guidelines to help meet the desired conditions for Bi-State sage grouse (USDA 2016).

**Habitat Requirements and Natural History:** Sage grouse are largely dependent upon sagebrush ecosystems for both foraging and breeding. Breeding sites, or “leks” are usually situated on ridge tops or grassy areas surrounded by a substantial brush and herbaceous component (Schroeder et al 1999). Nesting habitat for sage grouse is characterized primarily by Wyoming big sagebrush communities that have 15 to 38 percent canopy cover and a grass and forb understory. Dense sagebrush cover is important to nesting success of sage grouse (Connelly et al 2000). Sage grouse breed between mid-February and late August with nesting and brood-rearing occurring during May through July (Stiver 2006). Summer and dispersal habitat consists of sagebrush mixed with areas of wet meadows, riparian, or irrigated fields. As vegetation begins to dry out over summer, sage grouse will move to wetter meadows where succulent grasses and an abundance of insects can usually be found.

The Bi-State DPS is a genetically unique meta-population of greater sage-grouse that defines the far southwestern limit of the species’ range (Bi-State Plan 2012). The population is thought to be genetically distinct due to natural geologic events and subsequent long-term geographic isolation (ibid). The range of the Bi-State DPS occurs over an area approximately 170-miles long and up to 60 miles wide. It includes portions of five counties in western Nevada: Douglas, Lyon, Carson City, Mineral, and Esmeralda; and three counties in eastern California: Alpine, Mono, and Inyo.

**Potential for Occurrence in the Project Area:** The state wildlife agencies from Nevada and California along with various other stakeholders identified six Population Management Units (PMUs) to describe occupied habitat within the Bi-state area (Bi-State Plan 2012). Two of these PMUs occur on the Bridgeport Ranger District (Desert Creek/Fales and Mount Grant) and one occurs on the Carson Ranger District (Pine Nut). The PMUs are comprised of a variety of public (BLM, USFS) lands as well as state, private and Native American lands. Approximately 347,794 acres of the PMUs occur on HTNF lands within the project area. Population estimates for sage grouse in the Pine Nut PMU are not known (Ibid). However, based on an eleven year data set of monitoring leks in the Pine Nut PMU, male attendance at leks appears to be increasing.

**Threats:** In 2012, an Action Plan for the Bi-State sage grouse was prepared to develop a comprehensive set of strategies, objectives, and actions to accomplish specific goals and objectives for effective long-term conservation of the Bi-State sage-grouse and their habitats (Bi-State Plan 2012). The Action Plan also provided risk assessments for each PMU based on identified threats that were pertinent to each area. Invasive species was listed as a “high” potential threat only in the Pine Nut PMU. This area has endured numerous wildfires in the past two decades resulting in type conversion of thousands of acres of native plant communities to cheatgrass throughout the PMU. Currently within the portion of the Pine Nut PMU that occurs within the project area, there are approximately 274 acres of mapped invasive grasses and

noxious weeds. This accounts for approximately 0.4% of the total available acres of the PMUs within the project area.

The other PMUs are considered low to moderate risk of invasions primarily due to a more infrequent fire history and generally higher elevation compared to the Pine Nut PMU. Within the Desert Fales PMU only 0.6 acres of noxious weeds have been mapped (within the project area) and none are currently known to occur within the Mt. Grant PMU. However, all of the PMUs remain vulnerable to future infestations, particularly if a large enough disturbance were to occur (e.g wildfire). Non-native annual grasses such as cheatgrass is the most prominent weed that occurs in sage grouse habitat. Noxious weeds such as thistles, knapweeds, and whitetop occur only rarely in sagebrush habitat due to the lack of water and other habitat features associated with those species.

In 2016, the Forest Service amended the 1986 Toiyabe Forest and Land Management Plan to include standards and guidelines to help meet the desired conditions for Bi-State sage grouse (Greater Sage-grouse Bi-state Distinct Population Segment Forest Plan Amendment Record of Decision USDA 2016). Standards and guides from the plan related to invasive species management include avoiding the use of herbicides during the critical disturbance period for Bi-State sage grouse (March 1 – May 15 (+/- 2 weeks depending on conditions) (Weed S-01, USDA 2016). In addition, herbicides would only be used in Bi-State sage grouse habitat if other integrated pest management approaches are inadequate or infeasible. An integrated approach to controlling invasive species in Bi-State sage grouse habitat would be followed including potentially the use of grazing (Weed G-01 USDA 2016).

Invasive species such as cheatgrass is the most prominent weed that occurs in sage grouse habitat. Noxious weeds such as thistles, knapweeds, and perennial pepperweed occur only rarely in sagebrush habitat due to the lack of water and other habitat features associated with those species. Treatment of cheatgrass can be accomplished using many of the methods described in the proposed action including herbicide, hand pulling (manual), grazing, prescribed burning and mowing (mechanical). In order to successfully reduce or eliminate cheatgrass often multiple treatment methods need to be used either in the same growing season or in future years. Direct and indirect impacts to sage grouse from these treatment methods are described below.

### **Direct and Indirect Impacts**

*Manual and Herbicide Treatments:* Within sage grouse habitat, weed crews and their equipment could temporarily displace individual sage grouse while weed treatment efforts were being conducted. However, disturbance would be temporary, lasting only one to two days and would not occur within active nesting/lekking areas until after the critical disturbance period for sage grouse. Herbicide treatments for cheatgrass are generally applied as a pre-emergent during the fall and would therefore avoid the critical disturbance period for sage grouse. On the HTNF, herbicides used to control annual grasses, including rimsulfuron (Matrix) and sulfometuron-methyl (Oust) are used as a pre-emergents that are applied during the fall months. Non-native thistles and knapweeds would either be hand pulled or treated with an herbicide such as aminopyralid (Milestone) or chlorsulfuron (Telar). The ecological effects of the above herbicides as well as glyphosate (Rodeo), imazapyr (Habitat), and triclopyr (Garlon 3A) are discussed in detail in Ecological Risk Assessments described at the beginning of the Terrestrial Wildlife Section and in the BE. In summary, there are no acute or chronic exposure scenarios at application rates described in the Proposed Action that will result in a Hazard Quotient (HQ) above one for granivorous birds, such as the sage grouse. Herbicides and surfactants applied as described in the

Proposed Action pose no risk to these species. Triclopyr was the only chemical that HQs exceeded the level of concern ( $HQ > 1$ ) for exposures to birds involving the consumption of contaminated vegetation. However, the HQs are based on worst case scenario exposures and do not account for factors such as timing and method of application, animal behavior and feeding strategies and/or implementation of project design criteria. Under the Proposed Action, triclopyr would not be used in or near sage grouse habitat as this chemical is only used in targeted situations to treat salt cedar tamarisk which occurs at low elevations as scattered, isolated populations.

There will be no long term negative impacts to sage grouse habitat under the proposed action from manual or herbicide treatments. From a habitat and forage perspective, sagebrush, forbs (especially those in the composite family), and grasses are important to sage-grouse. Perennial grasses, once they are past the seedling stage, are largely tolerant of the herbicides such as imazapyr and sulfometuron methyl which are often used to control annual grasses. The use of pre-emergent herbicides to control annual grasses such as cheatgrass is recommended as a sage-grouse habitat management guideline (Connelly et al. 2000). Areas that are treated manually will likely revegetate within the same growing season or by the following year. Effects to non-target plant species from herbicides will be minimal due to the timing of the application (fall) and the species specific herbicides that will be used. Over the long term, control and eradication of invasive species such as cheatgrass in Bi-State sage grouse habitat will help maintain quality habitat for this species.

#### *Biological Controls:*

Targeted grazing: To be most effective in treating annual invasive grasses, targeted grazing would likely be conducted during green up which may, in some years, coincide with the lekking and/or nesting season for sage grouse. To minimize potential impacts to nesting sage grouse, any targeted grazing activities would be conducted after the critical disturbance period (May 15). In addition, early season targeted grazing activities would not occur in known lekking or nesting areas to avoid potential trampling or other disturbance to nest sites, eggs or sage grouse chicks. Targeted grazing outside of the nesting areas may still result in some disturbance and temporary displacement of individual sage grouse. However, for the purposes of weed control, livestock are expected to sweep through the treatment area, rather than congregate in one place for an extended period, which would limit potential long term, permanent impacts from trampling and other disturbance associated with grazing. Overtime, any short term impacts to sage grouse would be offset by overall improved habitat conditions for the species by reducing invasive grass species populations.

Insects: It is unlikely that insects would be used in sage grouse habitat for biological control purposes. Currently there is no known insect or pathogen that is effective in reducing cheatgrass infestations. Although other noxious weeds such as thistles can occasionally occur in some portions of sage grouse habitat, they typically occur in such small numbers that the use of insects would not be effective. If biological controls were used, they pose little threat to sage grouse habitat. Under the Proposed Action, only biological control agents that are permitted for release by the USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) will be used. Before being permitted by APHIS and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018). By utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal.

*Mechanical and Prescribed Burning-* Mechanical treatments (mowing) and prescribed burning would potentially be used where necessary as part of an integrated approach to treat dense monocultures of invasive species. In these areas, sage grouse would likely not be present because habitat conditions would be in a degraded state and no longer contain sagebrush and other native plant species important to sage grouse. In dense populations of invasive species, mowing and prescribed burning can reduce grass height and density and allow for more efficient applications of other weed treatment methods including herbicide, seeding, etc. Mowing and prescribed burning would be conducted in small acre increments of no more than 20 acres to assure careful control of intensity and size.

Monitoring of burned sites would continue for several years to determine if follow-up treatments are necessary. A site specific burn plan, and close consultation and coordination with a fuels specialist and other resource specialists, would be completed before any prescribed burning activities occurred. The burn plan would specify burning conditions necessary to minimize the threat of escaped fire from occurring. To avoid disturbance and other potential impacts to nesting sage grouse, prescribed burning will not occur in lekking and breeding habitat areas and mowing will not occur during the lekking or breeding season for sage grouse. Individual sage grouse that may be present in areas adjacent to treatment sites could be temporarily impacted from smoke and disturbance associated with treatment equipment (vehicles, crews). Sage grouse may be flushed from the site and avoid the area while treatments are occurring. However, because mechanical treatments and prescribed burning would occur only rarely and under highly controlled circumstances, and in areas where sage grouse likely no longer occur, impacts from these treatments would be minor and impact individual sage grouse for a short period of time (one to two days) and not result in any long term impacts to the viability of a population. Mowing and prescribed burning applications would meet standard Weed S-01 under the Greater Sage-grouse Bi-state DPS Forest Plan Amendment as these treatment methods will only occur in areas dominated by dense patches of invasive species and will not occur in areas that are predominately comprised of native vegetation.

Some short term impacts to sage grouse habitat would result from prescribed burning treatments while native plant communities recover. Recovery period could take potentially up to five years for reestablishment of native grasses and re-sprouting of sagebrush. Over the long term, however, habitat conditions would be improved by removing non-native grasses and allowing for sagebrush stands to recover.

**Cumulative Impacts:** For the purpose of this analysis, cumulative impacts include those that have been identified in the Bi-State Conservation Plan as High Risk factors for sage grouse within the six PMUs (Bi-State Plan 2012). Impacts that are expected to occur within the next ten years within suitable habitat within the analysis area will be addressed. Ten years is assumed to be an adequate timeframe to gauge how stochastic or longer term events may be affecting population trends.

The Bi-State Conservation Plan identifies several risk factors as having either a “High” “Moderate” or “Low” potential for negatively affecting sage grouse within each of the PMUs. While each PMU has unique risk factors, some commonalities, including risk of wildfire, pinyon juniper encroachment and invasive species occur across several of the PMUs.

Within the last decade, wildfire has burned thousands of acres of Bi State sage grouse habitat within many of the PMUs. For example, important nesting habitat near the Mill Canyon Dry Lake Lek site in the Pine Nut PMU burned during the 2007 Adrian Fire. Adjacent to the project area and within the very south end of the PMU, the Larson Fire of 2007 and the 2008 Slinkard Fire burned almost 2,000 acres. The

Bridgeport Spring Peak fire in 2013 burned nearly 12,000 acres of sage grouse habitat in the Mount Grant PMU. Cheatgrass and other invasives are present in some of these burned areas; however, post fire restoration efforts, such as seeding and active weed management have helped with native plant restoration. To reduce the threat of future high intensity fires, the BLM, the Forest Service and other local agencies have completed or are in the process of completing multiple fuels reduction projects and habitat restoration projects in or near important breeding habitat within the Pine Nut, Desert Creek, and Mount Grant PMUs (Bi-State Plan 2012). Under the proposed action, treatment of invasive species such as cheatgrass will also help reduce the fuel loading in sagebrush habitat as well as reduce the threat of increased infestations following a wildfire. The effects from the proposed action would not incrementally result in negative impacts to the Bi-State sage grouse when considered along with the effects of past, present and reasonably foreseeable actions.

**Determination:** Based on the above assessment it is my determination that some minor disturbance associated with treatment efforts may impact individual sage grouse, but will not lead to a trend toward federal listing or loss of viability.

### **PEREGRINE FALCON**

***Range, Distribution and Status:*** The peregrine falcon has the most extensive natural distribution of any bird in the world and is found on all continents except Antarctica (White et al 2002). Peregrine falcons are not known to occur on the Carson Ranger District. Recent nesting activity has been recorded on the Lake Tahoe Basin Management Unit, approximately 40 miles southwest of the project area. The peregrine falcon was listed by the US Fish and Wildlife Service as Endangered in 1970, and was the first species listed as endangered by the State of California. The population suffered dramatic declines beginning in the 1940's due to ingestion of prey contaminated with the pesticide commonly known as DDT. Peregrine falcons were delisted from the Endangered Species list in 1999 following the ban of DDT in 1972, and a long recovery effort.

***Habitat Requirements and Natural History:*** Peregrines are known to occur at elevations ranging from sea level to 11,000 feet in areas containing cliffs or rocky outcroppings with large spans of open space in which to hunt. Nest sites are almost exclusively situated on cliffs or rocky outcroppings. Breeding generally begins in mid-March when pairs arrive at nest sites. Eggs are generally laid by mid-April, and incubation of eggs is between 33 and 35 days (White et al 2002). Peregrine falcons generally search for prey while soaring or perched on cliffs at higher altitudes, and capture prey while in flight by diving from above. Peregrine falcons generally hunt within nine miles from the nest, however they may travel as far as 15 miles daily in search of prey (Enderson and Craig 1997; Mearns 1985).

***Potential for Occurrence:*** Peregrine falcons are not known to nest within the project area but could potentially forage within the project area, particularly on the Carson Ranger District where a nest is known to occur approximately 10 miles north of the District boundary on the Lake Tahoe Basin Management Unit.

### ***Direct and Indirect Impacts***

Under the proposed action there will be no impacts to the peregrine falcon from any of the treatment activities. None of the treatment activities proposed has the potential to limit or disrupt foraging opportunities as peregrines typically hunt their prey on the wing, diving at birds in the air from above and at high speeds. Prey species, which are primarily small birds, could occasionally be disturbed or

temporarily displaced from treatment activities. However, this disturbance would be minor, and not contribute to any declining trends of bird populations or disrupt foraging opportunities for peregrine falcons.

As discussed in the migratory bird section below, there will be no direct or indirect impact to migratory birds (potential prey for peregrine falcons) from the use of herbicides. SERA risk assessments indicate that at proposed application rates, the estimated doses from the exposure scenarios are all less than the reported NOAEL (no-observable adverse effect level) for all herbicides other than triclopyr. The acute exposure scenario at application rates described in the Proposed Action could result in a HQ slightly above one for a small birds. Under the Proposed Action, triclopyr will only be used in limited situations, primarily to treat woody species such as salt cedar tamarisk (currently there are only a few (3-4) known tamarisk plants within the project area). Triclopyr will be applied using direct application methods such as wick and wipe on individual plants or cut-stump application which will minimize the risk of non-target exposure and accidental drift. Other herbicides and surfactants applied as described in the Proposed Action pose no risk to prey for peregrine falcons such as migratory birds.

***Determination:*** Based on the above, it is my determination there will be **no direct, indirect, or cumulative impacts** to peregrine falcons from the proposed action.

## **BALD EAGLE**

***Range, Distribution, and Status:*** The Bald eagles' breeding range in the west extends along the western coast from southern Alaska through the Pacific Northwest to Northern California. A few small populations live in Arizona and Colorado. On June 28<sup>th</sup>, 2007 the bald eagle was removed from the Federal list of threatened and endangered species. The final rule delisting the bald eagle was published on July 9, 2007 and became effective on August 8, 2007. After delisting, bald eagles continue to be protected under the Bald and Golden Eagle Protection Act (BGEPA). Both of these laws prohibit killing, selling or otherwise harming eagles, their nests or their eggs. Since delisting, bald eagles have been managed as a Forest Sensitive species.

***Habitat Requirements and Natural History:*** In California, trees selected for nesting are characteristically one of the largest in the stand with tree heights usually over 100 feet tall with an average diameter of 43 inches and are in stands where the canopy cover is less than 40% (Jackman and Jenkins 2004). The majority of bald eagle nests are within one mile of water and almost always have an unobstructed view of a waterbody. Bald eagles generally require large bodies of water such as lakes or rivers which provide abundant forage and adequate room for foraging. The most common prey items for bald eagles include fish, waterfowl, jackrabbits, and various types of carrion (USDI 1986).

In the Sierra Nevada, it is estimated that between 100 to 300 bald eagles winter on Sierra Nevada Forests, and at least 151 to 180 pairs remain year round to breed. Breeding for bald eagles generally occurs February to July, but nesting can be initiated as early as January at lower elevations. Incubation may begin in late February to mid- March, with the nestling period extending to the end of June. From June through August, the fledglings remain restricted to the nest until they are able to move around within their environment.

***Potential for Occurrence:*** On the Bridgeport Ranger District there is one bald eagle nest which is located on National Forest System (NFS) lands above 7,000 feet in the Twin Lakes area. On the Carson Ranger

District, there are currently three known reproductive pairs (all in Alpine County) including Heenan Lake and Red Lake which are located on California Department of Fish and Wildlife lands and Indian Creek Reservoir which is located on BLM lands. The Heenan Lake and Red Lake nest sites are located in close proximity to NFS lands. Currently there are no mapped noxious weeds within .25 miles of these nests.

**Threats:** Habitat loss is considered to be one of the biggest threats to bald eagles. Urban and recreational development, logging, mineral exploration and extraction, and all other forms of human activities can negatively affect the suitability of breeding, wintering, and foraging areas.

## **Environmental Consequences**

### **Direct and Indirect Impacts**

*Manual and Herbicide Treatments:* Under the proposed action there will be no measureable impacts to bald eagles from treatment activities. Potential effects of invasive plant treatment methods on bald eagles include primarily disturbance that may occur during the nesting season. Bald eagles are sensitive to human disturbance during the period of time between January 1 and August 15, particularly within sight distance of nest sites. The direct effects from invasive plant treatment could include disturbance caused by noise, people and vehicles. Human and vehicle presence can disturb bald eagles during the breeding season, causing the birds to leave nests, or stay away from the nest long enough to have detrimental effects to eggs or young (USDI Fish and Wildlife Service, 1986). Project Design Feature 27 ensures that a Limited Operating Period will be applied to eliminate sources of disturbance in proximity to known nest sites. Weed treatments proposed near bald eagle nests on NFS lands and adjacent lands would follow the disturbance buffer guidelines in the National Bald Eagle Management Guidelines (USDI 2007) to minimize any potential disturbance to bald eagles. This DF minimizes the likelihood that disturbance of bald eagles will result from treatment of future infestations. Furthermore, given there is just one nest site within the project area (on NFS lands), located at high elevation, the likelihood of large weed infestations and thus the need for treatments, is considered to be very low.

Herbicide Toxicity SERA risk assessments and project worksheets have been reviewed. There are no acute or chronic exposure scenarios at application rates described in the Proposed Action that will result in a Hazard Quotient (HQ) above one for a large fish-eating bird such as the bald eagle. Herbicides and surfactants applied as described in the Proposed Action pose no risk to bald eagles.

### *Biological Controls:*

Targeted grazing: It is unlikely targeted grazing would be necessary in habitat types associated with bald eagle nest sites. If applied, targeted grazing may result in some disturbance and temporary displacement of individual bald eagles. However, as with manual and herbicide treatment activities, an LOP following the National Bald Eagle Management Guidelines would be implemented to protect nesting bald eagles from disturbance. Furthermore, for the purposes of weed control, livestock are expected to sweep through the treatment area, rather than congregate in one place for an extended period, which would limit the amount of disturbance. Overtime, any short term impacts to mountain quail would be offset by overall improved habitat conditions for the species by reducing invasive grass species populations.

Insects: The release of biological controls pose no risk to bald eagles or their habitat. Under the Proposed Action, only biological control agents that are permitted for release by the USDA Animal

Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) will be used. Before being permitted by APHIS and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018). By utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal.

*Mechanical and Prescribed burning:* Mechanical treatments would not be used with the exception of the occasional use of hand held string trimmers, which may be needed for denser patches of noxious weeds. Noise from the trimmers may cause disturbance to bald eagles but the disturbance will be short and not cause any long term impacts to the species. Furthermore, under the proposed action, a LOP will be in place during the nesting season to protect bald eagles from disturbance. It is unlikely prescribed burning treatment methods would be proposed as a treatment method in habitat types associated with bald eagle nest sites. Prescribed burning may occur in more open habitats adjacent to bald eagle territories. Bald eagles may be exposed to some level of smoke from prescribed burning operations. However, prescribed burns would be conducted as low intensity burns, over small areas and therefore would result in reduced smoke output. Furthermore prescribed burns would generally last less than one day. If necessary an LOP would be implemented during the nesting season to minimize potential impacts to bald eagles from smoke and other disturbance.

Invasive plant treatments will not result in the alteration of bald eagle habitat including the potential removal of bald eagle nest or roost trees.

**Determination:** Based on the above assessment, it is my determination the Proposed Action may impact individual bald eagles from temporary disturbance (less than one day) but disturbance will not occur during or in proximity to nesting bald eagles. Therefore, impacts will not lead to a trend toward federal listing or loss of viability of bald eagle populations.

## **MOUNTAIN QUAIL**

**Range, Distribution, and Status:** The mountain quail is the largest North American quail and is a resident from southwestern British Columbia, western and southern Washington, central Idaho south through the mountains of California and western Nevada (NDOW 2012). Mountain quail are known to occur throughout the Carson Ranger District, usually at elevations above 5,000 feet. Mountain quail are listed as a Forest Sensitive species in the Intermountain and Pacific Southwest and Northwest Regions of the Forest Service.

**Habitat Requirements and Natural History:** Mountain quail often nest in high elevations up to 10,000 feet, occasionally migrating to lower elevation in the fall (Crawford and Pope 1999). In the Sierra Nevada, mountain quail were found nesting and foraging in mixed conifer stands that were mixed with montane chaparral brush communities composed of chinquapin, snowbrush, and Greenleaf manzanita (Ibid). Mean shrub cover requirements are approximately 51% with a mean shrub height of approximately 6.0 feet (Brennan et al. 1987). Mountain quail can also be opportunistic nesters utilizing a wide variety of habitat types for breeding. For example, quail have been documented nesting in old growth coniferous forest, mixed montane shrub communities, regenerating clear-cuts and old burned areas (Brennan et al 1987). In the Sierra Nevada, the reproductive period for mountain quail generally begins sometime in May with pair-bonding and nest site selection and ends in mid-July when the young are hatched and independent. Nests are often concealed under logs or fallen pine branches, in weeds, shrubs, or at the

base of large trees. Mountain quail usually nest within a few hundred yards of water to provide chicks with required water supply after hatching (Brennan et al 1987). Mountain quail feed on seeds, fruit, and insects.

**Potential for Occurrence:** Suitable habitat for mountain quail occurs within the mixed conifer and mountain shrub communities within the project analysis area. Approximately 91,205 acres of mixed conifer and montane chaparral habitat occur within the project area (CAIWMP Vegetation Report). Within this habitat type, noxious weeds are known to occur on 472 acres or 0.5% of the available mountain quail habitat. Actual distribution of mountain quail in the analysis area is not known. A literature search revealed very little information about population estimates for mountain quail in California and Nevada. Breeding Bird Survey information for Nevada estimates populations at 840 mountain quail; however, this data is considered only moderately reliable (GBBO 2010). For the Sierra Nevada population estimates are unknown. However, breeding bird survey data for this region suggest a trend that has been essentially stable from 1968 to 2016 (Sauer et al 2017).

**Threats:** In the Sierra Nevada, the main threat to mountain quail is loss of habitat due to human development (urbanization) (NDOW 2012). Other threats to mountain quail include habitat degradation/loss from livestock grazing, intense wildfires, water diversions, invasive plant species, and fuels reduction projects (GBBO 2010).

## **Environmental Consequences**

### **Direct and Indirect Impacts**

**Manual and Herbicide Treatments:** Noxious weeds found within habitat associated with mountain quail (high elevation chaparral /mixed conifer) typically occur as isolated plants within a small area. Therefore, weeds within this habitat type will generally be treated by hand pulling methods and herbicide. In some portions of the analysis area, the timing of weed treatments may overlap with the nesting season for mountain quail. Because of the secretive nature of nesting quail, some nest sites may be inadvertently disturbed during weed treatments causing displacement of individual quail. However, due to the low potential of infestations in mountain quail habitat, noxious weed treatments would happen infrequently and over a short period of time (less than one day). Mountain quail flushed from a foraging or a nesting site would readily return after the weed crews left the area. Because treatments would occur so infrequently and for a short period of time, no long term impacts to nesting and/or foraging success would occur.

SERA risk assessments were reviewed and indicate that at proposed application rates, the estimated doses from the exposure scenarios are all less than the reported NOAEL (no-observable adverse effect level) for all herbicides. There are no acute or chronic exposure scenarios at application rates described in the proposed action that will result in a Hazard Quotient (HQ) above one for granivorous birds such as the mountain quail. Herbicides and surfactants applied as described in the proposed action pose no risk to these species. Chronic exposures are also unlikely because of the limited treatments that would ever occur in mountain quail habitat. Mountain quail are typically eat seeds and insects foraged from the ground. Noxious weeds in montane chaparral and mixed conifer tend are primarily individual thistles and other biannual and perennial flowering plant species that can be treated by direct application of herbicide or hand pulling, thereby reducing the potential for herbicide exposure and drift to ground vegetation.

There will be no negative impacts to habitat for mountain quail under the proposed action. The treatment of these isolated individual plants will be a negligible loss to existing habitat and will not impact any life requisites for this species. Over the long term, control and eradication of noxious weeds in mountain quail habitat will help maintain quality habitat for this species.

*Biological Controls:*

Targeted grazing: Although targeted grazing is generally applied to more contiguous monocultures of noxious weeds, individual weed infestations in this habitat type could potentially develop into much larger ones following a disturbance such as a wildfire. Targeted grazing may result in some disturbance and temporary displacement of individual mountain quail. Depending on the weed species, grazing may need to occur during the spring and early summer when mountain quail could potentially be nesting. However, for the purposes of weed control, livestock are expected to sweep through the treatment area, rather than congregate in one place for an extended period, which would limit potential long term, permanent impacts from trampling and other disturbance associated with grazing. Overtime, any short term impacts to mountain quail would be offset by overall improved habitat conditions for the species by reducing invasive grass species populations.

Insects: The release of biological controls pose very little risk to mountain quail or their habitat and can benefit quail over the long-term by reducing noxious weed populations allowing for an increase in a robust and stable native plant communities. Under the Proposed Action, only biological control agents that are permitted for release by the USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) will be used. Before being permitted by APHIS and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018). By utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal.

*Mechanical and Prescribed Burning:* Because of the small potential for large contiguous noxious weed populations to occur in mountain quail habitat it is unlikely that mechanical and/or prescribed burning treatments would be proposed as a treatment method. Additionally, mechanical treatments such as mowing are generally not a practical treatment method in the dense montane shrub habitats associated with mountain quail. The occasional use of hand held string trimmers, which may be needed for isolated patches of noxious weeds, may result in minor noise related disturbance to individual mountain quail. However the disturbance would be short term (less than one day) and not cause any long term impacts to this species.

In the rare circumstance that prescribed burning would be used as a treatment method, burns would be conducted in small acre increments of no more than 20 acres to assure careful control of intensity and size. Monitoring of burned sites would continue for several years to determine if follow-up treatments are necessary. A site specific burn plan, and close consultation and coordination with a fuels specialist and other resource specialists, would be completed before any prescribed burning activities occurred. The burn plan would specify burning conditions necessary to minimize the threat of escaped fire from occurring.

Impacts to mountain quail from prescribed burning could be greater in the spring when quail may be nesting. Locations of mountain quail nest sites in the project area are currently unknown and are very difficult to locate. However, it is unlikely quail would be nesting in prescribed burn treatment areas as

these sites would be highly degraded from weed infestations and no longer suitable for mountain quail. Mountain quail present in areas adjacent to a treatment site might be impacted from the effects of smoke and heat. However, because prescribed burns will not occur in active nesting territories and will be carried out as low intensity burns in small increments, direct impacts to mountain quail will be minor and short term (one to two days). In areas where high quality habitat is adjacent to a treatment area, the wildlife biologist may recommend during the Annual Implementation Process to postpone burn until after the critical breeding period for mountain quail.

There will be no negative impacts to habitat for mountain quail under the proposed action. The treatment of these noxious and invasive weeds will be a negligible loss to existing habitat and will not impact any life requisites for either of these species. Over the long term, control and eradication of noxious weeds in mountain quail habitat will help maintain quality habitat for these species.

**Cumulative Impacts:** For the purpose of this analysis, cumulative impacts include those that have the potential to impact or have impacted mountain quail habitat within the project area in the past, present or foreseeable future. Catastrophic wildfires within the project area has led to the loss of mountain quail habitat along the eastern front of the Sierra Nevada Mountain range. Due to drought conditions, many of the burned areas have struggled to recover and no longer provide forage or cover value for mountain quail. In order to restore habitat in these burned areas, the Forest Service, as well as other local governments and non-profit groups, have implemented several native plant restoration projects in order to improve habitat in these areas. For example, in 2007 the Forest Service planted several thousand Jeffrey pine and mahogany seedlings in the 2007 Hawken Fire on the Carson Ranger District. Implementation of the proposed action will continue to help improve habitat conditions for mountain quail by maintaining native plant communities through the control and/or elimination of non-native species from their habitat. The effects from the proposed action would not incrementally result in negative impacts to the mountain quail when considered along with the effects of past, present and reasonably foreseeable actions.

**Determination:** Based on the above analysis, it is my determination the proposed action may impact individual mountain quail but will not lead to a trend toward federal listing or a loss of viability.

## **FLAMMULATED OWL**

**Range, Distribution, and Status:** Breeding populations of flammulated owls are found from central-southern British Columbia along the western United States to the Sierra Madre and mountain ranges of northern and central Mexico (Mika and Riddle 2006). In Nevada, Flammulated Owls have been documented during the breeding season in eleven mountain ranges including the Carson Range, and they could potentially occur in an additional 18 ranges (Dunham et al. 1996). Flammulated Owls are listed as a sensitive species in four U.S. Forest Service Regions, including Nevada (Intermountain Region 4).

**Habitat Requirements and Natural History:** Flammulated owls nest in a variety of conifer forest types between 6,000 and 10,000 feet elevation. Flammulated owls prefer older forests and are often found in association with old growth yellow pine forests mixed with red fir, aspen, white fir, and incense cedar (McCallum 1994). Older forests tend to have a higher abundance of snags and live trees with suitable nesting cavities. Preferred roosting and nesting habitat appears to be stands with dense understory vegetation with multi-layered stands (Ibid). Foraging habitat however is generally more open understory and forest/grassland edge habitats (McCallum 1994). In Nevada, flammulated owls breed in ponderosa pine, white fir, and limber pine with territory size ranging between 7 and 40 acres (McCallum 1994,

GBBO 2010). Flammulated owls are secondary cavity nesters and prefer cavities excavated by northern flickers and pileated woodpeckers (Arsenault et al, 2003).

Flammulated owls are migratory, wintering in Mexico and returning to the U.S. in late April to early May (McCallum 1994). Within the Sierra Nevada flammulated owls begin to migrate to Mexico by October and usually return in April with the establishment of territories in May (Polite and Harvey 2010a). Peak breeding months are June and July. Nests occur in cavity or woodpecker cavities in aspen, oak, or pine snags or trees. Nests are usually placed three to 40 feet above ground (Polite and Harvey 2010a). The young fledge in late July and disperse by September. Flammulated owls forage almost exclusively on insects including mostly moths, beetles, and grasshoppers.

***Potential for Occurrence:*** Suitable habitat for flammulated owls occurs on both Carson and Bridgeport Ranger districts. At least four nesting territories for flammulated owls are known to occur on the Carson Ranger District, one within the project area. Specific nest locations are not known for Bridgeport. Within the project area there is approximately 114,154 acres of Subalpine, Sierran mixed conifer, and eastside pine habitats that could provide potential habitat for flammulated owls (CAIWMP-Vegetation Report). Of these acres, approximately 251 acres, or 0.2%, are known to have some level of weed infestations. However, most of the infestations occur in the sagebrush dominated areas of mapped eastside pine habitat and are not considered high quality habitat for the flammulated owl.

***Threats:*** The greatest immediate risk to the flammulated owl is loss of critical nesting, security, and foraging habitat features from human and natural disturbances (i.e., tree harvesting, thinning, pest management, wildfires etc). In addition, snag removal for safety reasons or for firewood is also a threat. Long-term major threats are recruitment and maintenance of old-growth habitat features, particularly large diameter ponderosa/Jeffrey pine snags with cavities.

### **Environmental Consequences:**

#### **Direct and Indirect Impacts**

Under the proposed action, only minor and short term (less than one day) impacts to flammulated owls will occur. Late seral forest habitat types associated with these species are generally not conducive to large infestations of noxious and/or invasive weed species.

***Manual and Herbicide Treatments:*** Noxious weed treatments occurring within flammulated owl breeding habitat could result in some disturbance to roosting, foraging, or nesting activities. However, under the proposed action, treatment sites within active nesting areas would be avoided until after the critical nesting period for each species. Human disturbance to non-nesting flammulated owls from weed treatments may cause these species to be displaced from a roosting site or disrupt foraging activities. However, this disturbance would be temporary, lasting only the day (or less) and would not result in any measurable impacts to the viability of individuals or the population. There will be no direct or indirect impact to flammulated owls from the use of herbicides. There are no acute or chronic exposure scenarios at application rates described in the Proposed Action that will result in a Hazard Quotient (HQ) above one for insectivorous birds, such as the flammulated owl. Herbicides and surfactants applied as described in the Proposed Action pose no risk to these species.

There will be no negative impacts to habitat for flammulated owls under the proposed action. The treatment of these isolated individual plants will be a negligible loss to existing habitat and will not

impact any life requisites for either of this species. Over the long term, control and eradication of noxious weeds in flammulated owl habitat will help maintain quality habitat for this species.

*Biological Control Methods:* It is unlikely biological controls would be used in habitat associated with flammulated owl given the relatively small occurrences of noxious weeds associated with late seral mixed conifer habitat. However, a major disturbance such as wildfire may result in some localized expansions of noxious weeds where targeted grazing and or the use of biological control insects may be determined to be appropriate.

Targeted grazing: Targeted grazing may result in some disturbance and temporary displacement of flammulated owls. However, for the purposes of weed control, livestock are expected to sweep through the treatment area, rather than congregate in one place for an extended period, which would limit potential long term, permanent impacts from disturbance associated with grazing. Overtime, any short term impacts to these flammulated owls would be offset by overall improved habitat conditions for the species by reducing noxious weed populations.

Insects: If biological controls are determined to be an appropriate treatment method, there will be no measurable effects to this species or its habitat. Under the Proposed Action, only biological control agents that are permitted for release by the USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) will be used. Before being permitted by APHIS and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018). By utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal.

*Mechanical and Prescribed Burning:* Because of the small isolated noxious weed populations that occur in flammulated owl within the project area, mechanical and prescribed burning treatments would likely not be used. Additionally, mechanical treatments such as mowing are generally not a practical treatment method in late seral conifer stands associated with this species. The occasional use of hand held string trimmers, which may be needed for isolated patches of noxious weeds, may result in minor noise related disturbance to individual flammulated owls. However the disturbance would be short term (less than one day) and not cause any long term impacts to the species.

In the rare circumstance that prescribed burning would be used as a treatment method, burns would be conducted in small acre increments of no more than 20 acres to assure careful control of intensity and size. Monitoring of burned sites would continue for several years to determine if follow-up treatments are necessary. A site specific burn plan, and close consultation and coordination with a fuels specialist and other resource specialists, would be completed before any prescribed burning activities occurred. The burn plan would specify burning conditions necessary to minimize the threat of escaped fire from occurring.

Impacts to flammulated owls from prescribed burning could be greater in the spring when these species may be nesting. However, it is unlikely flammulated owls would be nesting in prescribed burn treatment areas as these sites would be highly degraded from weed infestations and likely no longer suitable for nesting. If nesting is suspected in a proposed treatment area, pre-treatment surveys would be conducted to check all trees with potential cavities within a proposed burn area and determine nesting status. If nesting is confirmed, treatments would be postponed until after the critical nesting period for this species.

Flammulated owls present in areas adjacent to a treatment site might be impacted from the effects of smoke and heat. However, because prescribed burns will not occur in active nesting territories and will be carried out as low intensity burns in small increments, direct impacts to this species will be minor and short term (one to two days). Additionally, individual flammulated owls may be temporarily impacted from disturbance associated with treatment equipment (vehicles, crews) and flushed from the site and avoid the area while treatments are occurring. Again, this disturbance will be short term, lasting only as long as crews are in the area (one to two days) and will not result in any long term negative effects.

There will be no negative impacts to habitat for flammulated owls under the proposed action. The treatment of these noxious and invasive weeds will be a negligible loss to existing habitat and will not impact any life requisites for either of this species. Over the long term, control and eradication of noxious weeds in flammulated owl habitat will help maintain quality habitat for this species.

**Cumulative Impacts:** For the purpose of this analysis, cumulative impacts include those that have the potential to impact or have impacted habitat for flammulated owls within the project area in the past, present or foreseeable future. The largest threat to flammulated owls is loss of late seral conifer habitat. Both of these species rely on densely forested stands that are composed of mixed age trees with multiple canopy layers. Along the Sierra front and particularly on the Carson Ranger District, fuels reduction projects in or near suitable habitat for flammulated owls has likely resulted in some disturbance to individual species, and in some areas resulted in a reduced availability of quality habitat. However, survey protocols and design features associated with these projects were incorporated to minimize direct and indirect impacts and to the species and provide protection for critical nesting and foraging habitat. Treatment of noxious weeds in habitat for flammulated owl will over the long term help protect and maintain habitat quality for this species. Although current weed infestations in late seral conifer habitat type is rare, being quick to eliminate and control weeds will assure that infestations do not get larger and that native plant communities are protected. If left untreated, a type conversion of native plants to non-native noxious weeds would over time potentially affect the foraging availability of the flammulated owl by diminishing habitat quality for their prey. The effects from the proposed action would not incrementally result in negative impacts to the flammulated owl when considered along with the effects of past, present and reasonably foreseeable actions.

**Determination:** In summary, under the proposed action, there may be minor impacts to flammulated due to disturbance associated with conducting weed treatments. Over the long term, control and eradication of noxious weeds in flammulated owl habitat will help maintain quality habitat for these species. Therefore, it is determined that the proposed action may impact individual flammulated owls, but will not result in a trend toward federal listing or a loss of viability.

### **WHITE-HEADED WOODPECKER**

**Range, Distribution, and Status:** In California, the white-headed woodpecker occurs in the Sierra Nevada, Cascade, Klamath, Transverse and Peninsula Ranges, and Warner Mountains (Polite and Harvey 2010b). White-headed woodpeckers are year round residents on the Carson and Bridgeport Ranger Districts. White-headed woodpeckers are listed as a Sensitive Species in the Intermountain and northern regions of the U.S. Forest Service.

**Habitat Requirements and Natural History:** Habitat for white-headed woodpeckers overlaps with habitat for flammulated owls. Preferred habitat appears to be stands with large diameter trees, soft snags

averaging 23 inches dbh, and 40 to 70 percent canopy cover. White-headed woodpeckers occur more often in old growth conifer stands that contain a dense number of standing snags (GBBO 2010). White-headed woodpeckers are also found in open-canopied conifer stands where large diameter trees and snags are present (Garrett et al 1996). More than 50 percent of the white-headed woodpecker's diet is composed of pine seeds during some parts of the year. They also feed on insects found on the bark of live and dead tree trunks. White-headed woodpeckers are tolerant of human activity in nest vicinity as long as activity does not involve nest tree; birds become extremely agitated if nest itself is disturbed (Garrett et al 1996). White-headed woodpeckers are also tolerant of humans near roosting areas as long as human activity is not prolonged (Ibid).

**Potential for Occurrence:** Actual distribution of white-headed woodpeckers in the analysis area is not known. Breeding bird survey data for the Sierra Nevada region suggest a trend that has been essentially stable from 1968 to 2016 (Sauer et al 2017). Suitable habitat for white-headed woodpeckers overlaps with other late seral species, such as the flammulated owl, in that they require relatively dense canopy cover with an abundance of large diameter dead and live trees. Within the project area there is approximately 114,154 acres of Subalpine, Sierran mixed conifer, and eastside pine habitats that could provide potential habitat for white-headed woodpeckers (CAIWMP-Vegetation Report). Of these acres, approximately 251 acres, or 0.2%, are known to have some level of weed infestations, most of which occur in the sagebrush dominated areas of mapped eastside pine habitat and are not considered high quality habitat for the white-headed woodpecker.

**Threats:** The primary threat to white-headed woodpeckers is over-harvesting of large diameter trees, especially ponderosa pine (USDA, 1991).

### **Environmental Consequences**

Within the project area there is approximately 114,154 acres of Subalpine, Sierran mixed conifer, and eastside pine habitats that could provide potential habitat for flammulated owls and white-headed woodpeckers (CAIWMP-Vegetation Report). Of these acres, approximately 251 acres, or 0.2%, are known to have some level of weed infestations, most of which occur in the sagebrush dominated areas of mapped eastside pine habitat and are not considered high quality habitat for white-headed woodpecker.

### **Direct and Indirect Impacts**

Under the proposed action, only minor and short term (less than one day) impacts to white-headed woodpeckers will occur. Late seral forest habitat types associated with this species is generally not conducive to large infestations of noxious and/or invasive weed species.

**Manual and Herbicide Treatments:** Noxious weed treatments occurring within white headed woodpecker breeding habitat could result in some disturbance to roosting, foraging, or nesting activities. However, under the proposed action, treatment sites within active nesting areas would be avoided until after the critical nesting period for each species. Human disturbance to non-nesting white-headed woodpeckers from weed treatments may cause this species to be displaced from a roosting site or disrupt foraging activities. However, this disturbance would be temporary, lasting only the day (or less) and would not result in any measurable impacts to the viability of individuals or the population. There will be no direct or indirect impact to white-headed woodpeckers from the use of herbicides. There are no acute or chronic exposure scenarios at application rates described in the Proposed Action that will result in a Hazard

Quotient (HQ) above one for insectivorous birds, such as white-headed woodpecker. Herbicides and surfactants applied as described in the Proposed Action pose no risk to these species.

There will be no negative impacts to habitat for white-headed woodpeckers under the Proposed Action. The treatment of these isolated individual plants will be a negligible loss to existing habitat and will not impact any life requisites for either of these species. Over the long term, control and eradication of noxious weeds in white-headed woodpecker habitat will help maintain quality habitat for this species.

*Biological Control Methods:* It is unlikely biological controls would be used in habitat associated with white-headed woodpecker given the relatively small occurrences of noxious weeds associated with late seral mixed conifer habitat. However, a major disturbance such as wildfire may result in some localized expansions of noxious weeds where targeted grazing and or the use of biological control insects may be determined to be appropriate.

Targeted grazing: Targeted grazing may result in some disturbance and temporary displacement of white-headed woodpeckers. However, for the purposes of weed control, livestock are expected to sweep through the treatment area, rather than congregate in one place for an extended period, which would limit potential long term, permanent impacts from disturbance associated with grazing. Overtime, any short term impacts to white-headed woodpeckers would be offset by overall improved habitat conditions for the species by reducing noxious weed populations.

Insects: If biological controls are determined to be an appropriate treatment method, there will be no measurable effects to this species or its habitat. Under the Proposed Action, only biological control agents that are permitted for release by the USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) will be used. Before being permitted by APHIS and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018). By utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal.

*Mechanical and Prescribed Burning:* Because of the small isolated noxious weed populations that occur in white headed woodpecker habitat within the project area, mechanical and prescribed burning treatments would likely not be used. Additionally, mechanical treatments such as mowing are generally not a practical treatment method in late seral conifer stands associated with this species. The occasional use of hand held string trimmers, which may be needed for isolated patches of noxious weeds, may result in minor noise related disturbance to individual white-headed woodpeckers. However the disturbance would be short term (less than one day) and not cause any long term impacts to the species.

In the rare circumstance that prescribed burning would be used as a treatment method, burns would be conducted in small acre increments of no more than 20 acres to assure careful control of intensity and size. Monitoring of burned sites would continue for several years to determine if follow-up treatments are necessary. A site specific burn plan, and close consultation and coordination with a fuels specialist and other resource specialists, would be completed before any prescribed burning activities occurred. The burn plan would specify burning conditions necessary to minimize the threat of escaped fire from occurring.

Impacts to white-headed woodpeckers from prescribed burning could be greater in the spring when these species may be nesting. However, it is unlikely white-headed woodpeckers would be nesting in prescribed burn treatment areas as these sites would be highly degraded from weed infestations and likely no longer suitable for nesting. If nesting is suspected in a proposed treatment area, pre-treatment surveys would be conducted to check all trees with potential cavities within a proposed burn area and determine nesting status. If nesting is confirmed, treatments would be postponed until after the critical nesting period for white-headed woodpecker. White-headed woodpeckers present in areas adjacent to a treatment site might be impacted from the effects of smoke and heat. However, because prescribed burns will not occur in active nesting territories and will be carried out as low intensity burns in small increments, direct impacts to this species will be minor and short term (one to two days). Additionally, individual white-headed woodpeckers may be temporarily impacted from disturbance associated with treatment equipment (vehicles, crews) and flushed from the site and avoid the area while treatments are occurring. Again, this disturbance will be short term, lasting only as long as crews are in the area (one to two days) and will not result in any long term negative effects.

There will be no negative impacts to habitat for white-headed woodpeckers under the proposed action. The treatment of these noxious and invasive weeds will be a negligible loss to existing habitat and will not impact any life requisites for this species. Over the long term, control and eradication of noxious weeds in white-headed woodpecker habitat will help maintain quality habitat for this species.

**Cumulative Impacts:** For the purpose of this analysis, cumulative impacts include those that have the potential to impact or have impacted habitat for white-headed woodpeckers within the project area in the past, present or foreseeable future. The largest threat to white-headed woodpeckers is loss of late seral conifer habitat. White-headed woodpeckers rely on densely forested stands that are composed of mixed age trees with multiple canopy layers. Along the Sierra front and particularly on the Carson Ranger District, fuels reduction projects in or near suitable habitat for white-headed woodpeckers has likely resulted in some disturbance to individual species, and in some areas resulted in a reduced availability of quality habitat. However, survey protocols and design features associated with these projects were incorporated to minimize direct and indirect impacts and to the species and provide protection for critical nesting and foraging habitat. Treatment of noxious weeds in habitat for white-headed woodpeckers will over the long term help protect and maintain habitat quality for this species. Although current weed infestations in late seral conifer habitat type is rare, being quick to eliminate and control weeds will assure that infestations do not get larger and that native plant communities are protected. If left untreated, a type conversion of native plants to non-native noxious weeds would over time potentially affect the foraging availability of the white-headed woodpecker by diminishing habitat quality for their prey. The effects from the proposed action would not incrementally result in negative impacts to the white-headed woodpecker when considered along with the effects of past, present and reasonably foreseeable actions.

**Determination:** In summary, under the proposed action, there may be minor impacts to white-headed woodpeckers due to disturbance associated with conducting weed treatments. Over the long term, control and eradication of noxious weeds in white-headed woodpecker habitat will help maintain quality habitat for this species. Therefore, it is determined that the proposed action **may impact** individual white-headed woodpeckers, but will not result in a trend toward federal listing or a loss of viability.

## **GREAT GRAY OWL**

***Range, Distribution, and Status:*** The majority of great gray owls found in California are known to occur in the Sierra Nevada, and primarily only in the greater Yosemite area (Hull et al 2010). Great gray owls are rarely found south of Yosemite, but recent detections exist as far south as the Sequoia National Forest (Tulare County) (Beck and Winter. 2000). The Sierra Nevada great gray owl population is the most southerly in the world. Recent research has concluded that the Sierra Nevada is home to a genetically distinct population of great gray owls, compared to great gray owls outside of California (Keane et al 2011). In addition to distinct genetic, differences in migration patterns, prey preference, and nest site selection have also been observed. Each of these genetic and behavioral characteristics indicates the Sierra Nevada population of great gray owls has been isolated from other populations for an extensive period of time (Ibid). The great gray owl is listed as Threatened Species in the State of California and is Forest Sensitive species in the Intermountain Region.

***Habitat Requirements and Natural History:*** In the Sierra Nevada, great gray owls are found in mixed coniferous forest from 2,400 to 9,000 feet elevation where such forests occur in combination with meadows or other vegetated openings. Nesting usually occurs within 600 feet of the forest edge and adjacent open foraging habitat. Virtually all of great gray owl records in California were from in or near meadow locations (Beck and Winter 2000). Although breeding will occur adjacent to meadows that are 10 acres in size, great gray owls generally require at least 25 acres of meadow to maintain reproduction over time (Beck and Winter 2000). Most nests are made in broken top snags (generally firs), but platforms such as old hawk nests, mistletoe infected limbs, etc. are also used. Nest trees or snags are generally greater than 21 inches dbh and 20 feet tall.

***Potential for Occurrence:*** Based on the historical sightings and the availability of suitable habitat, six great gray owl Protected Activity Centers (PACs) were delineated on the Bridgeport Ranger District totaling 1,190 acres in the early 2000's. However, great gray owls are not currently known to occur on the either the Carson or the Bridgeport Ranger District. Unverified sightings of great gray owls have been reported in a few locations on the Carson Ranger District. For example, a single occurrence of a great gray owl was documented in Little Valley, Washoe County, Nevada prior to 1985 (the exact date is unknown) (NNHP 2001). A sighting of a great gray owls was observed by the previous District Wildlife Biologist in the mid 1990's in the Carson Iceberg Wilderness (Alpine County, CA). Individual detections of great gray owls were reportedly observed on the Bridgeport Ranger District in the 1970s and early 1980s (Gould 2003). None of the sightings on the Carson or the Bridgeport Districts were verified and no breeding activity was ever reported. In 2006, intensive surveys for great gray owls were conducted throughout the Carson and portions of the Bridgeport Ranger District and resulted in no detections. Subsequent surveys in the Carson Iceberg Wilderness and Little Valley area also resulted in no detections. In addition, the annual surveys conducted for other species such as the California spotted owl and flammulated owl have resulted in no incidental sightings of great gray owls.

***Threats:*** Habitat loss from timber harvest and development are the primary threats facing great gray owls locally and globally (Williams, 2012). Other threats include reduction in habitat quality from fire suppression and wildfire; also direct human impacts (e.g. car strikes, electrocution) (Ibid).

### **Environmental Consequences:**

There has not been any recorded nesting activity for great gray owls in the project area and only a few incidental sightings have ever been recorded. Historic sightings of great gray owls were likely due to a migratory “irruptive” pattern that occurs in years when prey populations drop in historic breeding areas (Cheveau et al 2004). Due to the availability of potential habitat and known breeding occurrences on adjacent forests, great gray owls could eventually nest on the HTNF in the future. Currently there are no known noxious or invasive weeds within designated great gray owl PACs within the project area. Under the proposed action, treatment of new infestations of weeds in meadows and forested environments will help maintain native plant communities benefiting both great gray owls and their prey populations.

**Determination:** Based on the above assessment it is determined the proposed action will have **no direct, indirect, or cumulative impacts** on great gray owls and no further analysis will be conducted for this species.

### **CALIFORNIA SPOTTED OWL**

**Range, Distribution, and Status:** The California spotted owl is distributed throughout the forests of the western Sierra Nevada Mountains from Shasta County south to the Tehachapi Pass. There is a gap in the distribution south of the Sierras, with California spotted owls not occurring again until the southern and central coastal California. Just north of Lassen Peak to south of the Pit River, the range of California spotted owl transitions into that of the northern spotted owl (USDI 2017). The California spotted owl is listed as a Forest Sensitive species in the Pacific Southwest and Intermountain Regions (5, 4) of the Forest Service.

**Habitat Requirements and Natural History:** California spotted owls utilize mixed conifer, ponderosa pine, red fir and montane hardwood vegetation types. Nesting habitat is characterized by canopy closure (>70%) with medium to large trees and multi-storied structure stands. Foraging habitat can include all medium to large tree stands (>50% canopy closure) (Verner et al. 1992). California spotted owls tend to avoid stands with less than 40 percent canopy cover. In the Sierra Nevada, spotted owls appear to nest in roost areas where the slope is less than 30% (Verner et al 1992). Spotted owls feed primarily within forests on arboreal small mammals, including woodrats and flying squirrels. California spotted owls typically begin egg laying during late March and April with hatching occurring sometime in May (Gutierrez et al 1985). Adult owls continue to feed young until mid-August and by late October juveniles have dispersed from the natal area.

**Potential for Occurrence:** The HTNF conducts annual surveys for spotted owls following the Region 5 Protocol (USDA 1993). Surveys are conducted in historical nesting areas as well as in suitable habitat in proposed project sites. In accordance with the Sierra Nevada Forest Plan Amendment, nesting territories for spotted owls are delineated into approximate 300 acre Protected Activity Centers (PACS) to protect the best available habitat that surrounds a nest. Within the project area, there are currently four spotted owl PACS totaling approximately 1,200 acres, all on the Carson Ranger District. None of these PACS currently have noxious weed infestations.

**Threats:** Habitat alteration is considered to be the greatest threat to the California spotted owl. Loss of suitable habitat can result in higher risk of predation, lower prey availability, and lessened thermal protection.

### **Environmental Consequences:**

Under the proposed action, only minor and short term (less than one day) impacts to spotted owls will occur. Late seral forest habitat types associated with spotted owls are generally not conducive to large infestations of noxious and/or invasive weed species. None of the four spotted owl PACS that occur within the project area have known occurrences of noxious weeds.

### **Direct and Indirect Impacts**

*Manual and Herbicide Treatments:* Weed treatment occurring within spotted owl PACs could result in some disturbance to roosting, foraging, or nesting spotted owls. However, under the proposed action (Design Feature #29), treatment sites within active nesting areas would be avoided until after the critical nesting period for this species (typically after August although dates can vary). Human disturbance to non-nesting spotted owls from weed treatments may cause them to be displaced or disrupt foraging activities. However, this disturbance would be temporary, lasting only the day (or less) and would not result in any measurable impacts to the viability of individuals or the population. There will be no direct or indirect impacts to spotted owls from the use of herbicides. SERA risk assessments were reviewed and indicate that at proposed application rates, the estimated doses from the exposure scenarios are all less than the reported NOAEL (no-observable adverse effect level) for all herbicides. There are no acute or chronic exposure scenarios at application rates described in the Proposed Action that will result in a Hazard Quotient (HQ) above one for carnivorous birds, such as the spotted owl. Herbicides and surfactants applied as described in the Proposed Action pose no risk to these species. Chronic exposures are also unlikely because spotted owl prey are not known to prefer foraging on invasive plant species. This reduces the likelihood of chronic exposure since treatments are focused on the invasive plants and prey species are unlikely to consume these plants.

*Biological Control Methods:* It is unlikely biological controls would be used in the late seral mixed conifer habitat associated with California spotted owls due to the relatively small occurrences of noxious weeds. However, a major disturbance such as wildfire may result in some localized expansions of noxious weeds where targeted grazing and or the use of biological control insects may be determined to be appropriate.

Targeted grazing: Targeted grazing may result in some disturbance and temporary displacement of spotted owls. Targeted grazing may also impact habitat for prey species such as small rodents, by trampling and compaction of soil. However, for the purposes of weed control, livestock are expected to sweep through the treatment area, rather than congregate in one place for an extended period, which would limit potential long term, permanent impacts from disturbance associated with grazing. Overtime, any short term impacts to spotted owls would be offset by overall improved habitat conditions for the species by reducing noxious weed populations.

Insects: If biological controls are determined to be an appropriate treatment method, there will be no measurable effects to spotted owls or their habitat. Under the Proposed Action, only biological control agents that are permitted for release by the USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) will be used. Before being permitted by APHIS and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to

their release to ensure they will not pose a threat to non-target species (CDFA 2018). By utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal.

*Mechanical and Prescribed Burning:* Because of the small potential for noxious weed populations to occur in spotted owl habitat within the project area, mechanical and prescribed burning treatments would likely not be used. Additionally, mechanical treatments such as mowing are generally not a practical treatment method in late seral conifer stands. The occasional use of hand held string trimmers, which may be needed for denser patches of noxious weeds, may result in minor noise related disturbance to individual spotted owls. However the disturbance would be short term (less than one day) and not cause any long term impacts to this species.

In the rare circumstance that prescribed burning would be used as a treatment method, burns would be conducted in small acre increments of no more than 20 acres to assure careful control of intensity and size. Monitoring of burned sites would continue for several years to determine if follow-up treatments are necessary. A site specific burn plan, and close consultation and coordination with a fuels specialist and other resource specialists, would be completed before any prescribed burning activities occurred. The burn plan would specify burning conditions necessary to minimize the threat of escaped fire from occurring. Under the proposed action, active nesting territories would be avoided for treatment until after the critical breeding period for spotted owl (typically after August although dates can vary). Individual spotted owls that may occur in areas adjacent to treatment sites may be temporarily impacted from disturbance associated with treatment equipment (vehicles, crews). Spotted owls may be flushed from the site and avoid the area while treatments are occurring. Spotted owls may also be vulnerable to impacts from heat and smoke associated with prescribed burns. However, because prescribed burns will not occur in active nesting territories and will be carried out as low intensity burns in small increments, direct impacts to spotted owls will be minor and short term (one to two days).

There will be no negative impacts to habitat for spotted owls under the proposed action. The treatment of these noxious and invasive weeds will be a negligible loss to existing habitat and will not impact any life requisites for either of this species. Over the long term, control and eradication of noxious weeds will help maintain quality habitat for California spotted owls.

**Cumulative Impacts:** For the purpose of this analysis, cumulative impacts include those that have the potential to impact or have impacted the Protected Activity Centers (PACS) within the project area in the past, present or foreseeable future. The largest threat to California spotted owls is loss of late seral conifer habitat. Both of these species rely on densely forested stands that are composed of mixed age trees with multiple canopy layers. Along the Sierra front and particularly on the Carson Ranger District, fuels reduction projects in or near suitable habitat for spotted owls has likely resulted in some disturbance to individual owls, and in some areas resulted in a reduced availability of quality habitat. However, survey protocols and design features associated with these projects were incorporated to minimize direct and indirect impacts and to the species and provide protection for critical nesting and foraging habitat. Treatment of noxious weeds in habitat for the California spotted owl will over the long term help protect and maintain habitat quality for these species. Although current weed infestations in late seral conifer habitat type is rare, being quick to eliminate and control new weed occurrences, will assure that infestations do not get larger and that native plant communities are protected. If left untreated, a type

conversion of native plants to non-native noxious weeds would over time potentially affect the foraging availability of the California spotted owl by diminishing habitat quality for their prey.

**Determination:** Under the proposed action, there may be minor impacts to California spotted owls due to disturbance to non-nesting owls during treatment activities. If weed treatments are required within an active nesting territory, treatment activities will not occur until after the critical nesting period is over. Therefore, it is my determination that the proposed action **may impact individual California spotted owls but will not result in a trend toward federal listing or a loss of viability.**

## **PYGMY RABBIT**

**Range, Distribution, and Status:** The pygmy rabbit has a discontinuous distribution occurring in Montana, Wyoming, Idaho, Utah, Nevada, California, Oregon, and Washington (Larrucea, 2007). The pygmy rabbit is found throughout much of the Great Basin as well as some of the adjacent intermountain areas (Green and Flinders 1980). The eastern boundary extends to southwestern Montana and western Wyoming (Campbell et al. 1982). Central Nevada and northeastern California form the southern and western limits. The Washington State population is considered genetically distinct from the remainder of the species and has been listed as endangered by the USFWS.

**Habitat Requirements and Natural History:** The elevation range of pygmy rabbits in Nevada extends from 4,494 to over 7,004 feet and in California from 4,986 to 5,298 feet (Larrucea 2007). The Pygmy rabbit is dependent upon dense stands of big sagebrush for foraging and breeding habitat. Pygmy rabbits are found in alluvial fans, swales in a rolling landscape, large flat valleys, at the foot of mountains, along creek and drainage bottoms, in basins in the mountains, or other landscape features where soil may have accumulated to greater depths (Larrucea 2007). They are generally on flatter ground, sometimes on moderate slopes, but not on steep ground. Generally, pygmy rabbits burrow in loamy soils deeper than 20 inches. Soil composition needs to be able to support a burrow system with numerous entrances, but also must be soft enough for digging.

Recent studies on the pygmy rabbit's distribution and habitat in the State of Nevada has provided new insight in to microhabitat features associated with pygmy rabbit presence in the State. Between 2001 and 2006 a graduate student from University of Nevada Reno, surveyed historic locations of pygmy rabbits across the state and collected habitat information from approximately 2,000 occupied and unoccupied sites (Larrucea 2007). In Nevada, pygmy rabbits were more likely to be found in soils with lower sand and higher clay content. Soils with higher clay content would likely provide greater integrity for burrow persistence. Larrucea (2007) also found that pygmy rabbits did not occur where soils had a reddish tint although the reason for this was not clear. Presence of other key wildlife species also was negatively associated with pygmy rabbit presence. For example, the study found that most often pygmy rabbits and cottontail rabbits did not coexist likely due to competition for burrows and the cottontail's preference for denser understory vegetation. The winter diet of pygmy rabbits is comprised of up to 99 percent sagebrush. Similarly, presence of numerous rodent burrows in an area was also an indicator of excessively sandy soils and habitat not suitable for pygmy rabbits.

**Potential for Occurrence:** The known and historical distribution of pygmy rabbits does not include the Carson Ranger District (Larrucea 2007). Pygmy rabbits, however are known to occur near the Bodie Hills on the Bridgeport Ranger District, although no detections have been recorded on NFS lands. In general, the project area contains approximately 174,701 acres of big sagebrush habitat (CAIWMP Vegetation

Report), all of which is not suitable for pygmy rabbits due to soil types and topography that is not conducive to pygmy rabbit presence. Within sagebrush stands, 80 acres (.05% of available sagebrush habitat) of noxious weeds are known to occur.

**Threats:** The loss and degradation of habitat through fire, grazing, invasion of non-native annual grasses, energy development, and agricultural conversion is the largest threat facing pygmy rabbit populations (Whisenant 1990; Knick and Rotenberry 1995, 1997).

## **Environmental Consequences**

### **Direct and Indirect Impacts**

**Manual and Herbicide Treatments:** Weed treatments conducted by hand would involve weed crews digging individual plants or cutting and bagging flowering parts of weeds. Within pygmy rabbit habitat, weed crews could temporarily displace individual pygmy rabbits while weed treatment efforts were being conducted. However, weed crews would generally only be in a given treatment area for a day and generally only a few hours; therefore there would be no long term impacts to pygmy rabbits. Herbicides and surfactants applied as described in the Proposed Action pose no risk to pygmy rabbits. SERA risk assessments indicate that at proposed application rates, the estimated doses from the exposure scenarios are all less than the reported NOAEL (no-observable adverse effect level) for all herbicides. There are no acute or chronic exposure scenarios at application rates described in the proposed action that will result in a Hazard Quotient (HQ) above one for small mammals such as the pygmy rabbit. Because pygmy rabbit habitat is highly vulnerable to annual grass invasions, particularly after a wildfire, applications of pre-emergent herbicides will likely be a common technique to treat the infestations. This could potentially include applications of pre-emergent herbicides such as imazapyr, aminopyralid, and sulfometuron methyl using boom sprayers from trucks and or UTVS which can be less selective in targeted species than direct application techniques. Shrubs and forbs are slightly more vulnerable to imazapyr, and sulfometuron methyl than aminopyralid. To minimize potential injury to sagebrush, those chemicals would be used primarily in monoculture infestations where few shrubs and other forbs are present.

There will be no long term negative impacts to pygmy rabbit habitat under the proposed action from manual or herbicide treatments. From a habitat and forage perspective, sagebrush, is critical to the pygmy rabbit. As mentioned above, herbicides will be carefully selected when conducting treatments near pygmy rabbit habitat to reduce the potential for inadvertent damage or mortality to sagebrush. Areas that are treated manually will likely revegetate within the same growing season or by the following year. Over the long term, control and eradication of invasive species such as cheatgrass in pygmy rabbit habitat will help maintain quality habitat for this species.

### ***Biological Controls:***

**Targeted grazing:** Targeted grazing may result in some disturbance and temporary displacement of individual pygmy rabbits. However, for the purposes of weed control, livestock are expected to sweep through the treatment area, rather than congregate in one place for an extended period, which would limit potential long term, permanent impacts from trampling and other disturbance associated with grazing. Overtime, any short term impacts to pygmy rabbits would be offset by overall improved habitat conditions for the species by reducing invasive grass species populations.

Insects: It is unlikely that insects would be used in pygmy rabbit habitat for biological control purposes. Currently there is no known insect or pathogen that is effective in reducing cheatgrass infestations. Although other noxious weeds such as thistles can occasionally occur in some portions of pygmy rabbit habitat, they typically occur in such small numbers that the use of insects would not be effective. If biological controls are determined to be the appropriate treatment method, under the Proposed Action, only biological control agents that are permitted for release by the USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) will be used. Before being permitted by APHIS and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018). By utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal.

*Mechanical and Prescribed Burning*- Mechanical treatments (mowing) and prescribed burning would potentially be used where necessary as part of an integrated approach to treat dense monocultures of invasive species. In these areas, pygmy rabbits would likely not be present because habitat conditions would be in a degraded state and no longer contain sagebrush and other native plant species important to pygmy rabbits. In dense populations of invasive species, mowing and prescribed burning can reduce grass height and density and allow for more efficient applications of other weed treatment methods including herbicide, seeding, etc. Mowing and prescribed burning would be conducted in small acre increments of no more than 20 acres to assure careful control of intensity and size. Monitoring of burned sites would continue for several years to determine if follow-up treatments are necessary. A site specific burn plan, and close consultation and coordination with a fuels specialist and other resource specialists, would be completed before any prescribed burning activities occurred. The burn plan would specify burning conditions necessary to minimize the threat of escaped fire from occurring.

Individual pygmy rabbits that may occur in areas adjacent to treatment sites may be temporarily impacted from disturbance associated with treatment equipment (vehicles, crews). Pygmy rabbits may be flushed from the site and avoid the area while treatments are occurring. Pygmy rabbits may also be vulnerable to impacts from heat and smoke associated with prescribed burns. Prescribed burns can occur in the spring or the fall depending on outcome objectives. Impacts could be greater in the spring when more kits may potentially be present. However, pygmy rabbits live and birth in deep burrows (almost two feet deep) which would help protect adults and young from the effects of fire. Furthermore, prescribed fires would be conducted as fast (one to several hours), low to moderate intensity burns in small (<20 acre) increments that would only pose moderate risk to pygmy rabbits. Because mechanical treatments and prescribed burning would occur only rarely and under highly controlled circumstances, and in areas where pygmy rabbits are not likely to occur, impacts from these treatments would be minor and impact individual pygmy rabbits for a short period of time (one to two days) and not result in any long term impacts to pygmy rabbits.

Some short term impacts to pygmy rabbit habitat would result from prescribed burning treatments while native plant communities recover. Recovery period could take potentially up to five years for reestablishment of native grasses and re-sprouting of sagebrush. Over the long term, however habitat conditions would be improved by removing non-native grasses and allowing for sagebrush stands to recover.

**Cumulative Impacts:** Wildfires and invasion of non-native annual grasses are two of the largest threats to pygmy rabbits. Within the last decade, wildfire has burned thousands of acres of sagebrush habitat within and adjacent to the project area. Including the Spring Peak fire in 2013 which burned nearly 12,000 acres of primarily sagebrush habitat. Cheatgrass and other invasive species are present in some of these burned areas; however, post fire restoration efforts, such as seeding and active weed management have helped with native plant restoration. In 2015, a collaboration of agencies and volunteers planted several thousand sagebrush seedlings in the Spring Peak burn area to help restore sagebrush habitats. To reduce the threat of future high intensity fires, the BLM, the Forest Service and other local agencies have completed or are in the process of completing multiple fuels reduction projects and habitat restoration projects in or near important habitat sage grouse which could potentially benefit the pygmy rabbit as well (Bi-State Plan 2012). Under the proposed action, treatment of invasive species such as cheatgrass will also help reduce the fuel loading in sagebrush habitat as well as reduce the threat of increased infestations following a wildfire. The effects from the proposed action would not incrementally result in negative impacts to pygmy rabbits when considered along with the effects of past, present and reasonably foreseeable actions.

**Determination:** Based on the analysis conducted in the BE (summarized above), it is my determination the proposed action may impact individual pygmy rabbits but will not lead to a trend toward federal listing or a loss of viability.

#### **THE WESTERN (PALE TOWNSEND'S) BIG-EARED BAT**

**Range, Distribution, and Status:** The western big-eared bat occurs throughout the west and is distributed from the southern portion of British Columbia south along the Pacific Coast to central Mexico and east into the Great Plains, with isolated populations occurring in the south and southeastern United States (Piaggio 2005). In California, its geographic range is generally considered to encompass the entire state, except for the highest elevations of the Sierra Nevada (CDFW 2016). The Townsend's big-eared bat is listed as a Region 4 Forest Sensitive Species.

**Habitat Requirements and Natural History:** Western big-eared bats are found in a variety of habitat types including desert, native prairies, coniferous forests, mid-elevation mixed conifer, and riparian communities. However, this species is strongly correlated with the availability of caves and cave-like roosting habitat- primarily caves, mines, and tunnels (Piaggio 2005). Abandoned mines serve as primary roosting habitat for Townsend's big-eared bats (Brown et al 2002). In general, Townsend's big-eared bats require spacious cavern-like structures for roosting (Pierson et al. 1998) during all stages of its life-cycle (i.e., maternity roosts, day and night roosts, and hibernacula).

Townsend's are very loyal to natal sites and generally do not range farther than 10 kilometers from a roost site (Pierson et al 1998). Maternal colonies are usually established between March and June and disband in late August or early September (Piaggio 2005). Winter hibernating colonies usually form by late October and consist of one individual to several hundred bats (Brown et al 2002).

Townsend's big-eared bat forages along edge habitats (e.g., forested edges and intermittent streams), in forested habitat and along heavily vegetated stream corridors, and in open areas near wooded habitat, though they appear to avoid open, grazed pasture land (Pierson et al. 1998). Calm, fresh water sources required for drinking generally must be open and accessible (Ibid). In Nevada, Townsend's big-eared bats

are known to forage between .3 and 6.4 km (.18 to 3.2 miles) from roosting sites (Bradley et al 1996)

**Potential for Occurrence:** Within the project area, Townsend big-eared bats are known to roost on the Carson Ranger District near the Colorado Hill Mine in Alpine County, CA and Chemung Mine on the Bridgeport Ranger District. Both mining districts are currently closed to mining and have been inactive for numerous years. Noxious weeds do not occur within the immediate vicinity of the known roost sites. However, infestations of bull thistle occur within .25 miles of the Colorado Hill Mine site where Townsend big-eared bats could potentially forage.

**Threats:** The primary threats to Townsend's bats include habitat loss and mortality from mine closures and repeated disturbance from humans. Townsend's are highly sensitive to human disturbance and readily abandon roost sites after human visitation (Piaggio 2005).

### **Environmental Consequences**

#### **Direct and Indirect Impacts**

**Manual and Herbicide treatments:** There will be no measurable impacts to Townsend's big-eared bats from the use of manual or herbicide treatments. The primary roosting sites for Townsend's big-eared bat includes areas that are not subject to noxious weed infestations including caves, mines, and rock cliffs. Townsend's big-eared bats do occasionally roost in bark or in cavities of large diameter, old growth conifers. However, old growth conifer areas are typically not associated with high densities of noxious weeds and therefore any weed treatment near a potential roost site would be rare. Potential foraging habitat for this species such as riparian areas, are prone to some level of noxious weed infestations. However, bats are nocturnal foragers, weed treatment activities, which occur during the day, would not result in any disturbance to foraging bats.

Because of their high rate of food intake, high metabolic rates, and high rate of fat mobilization, all bats can be at risk of bioaccumulation of toxic chemicals from high levels of pesticides found in their prey (insects), particularly when insecticides are used (Luce et al 2007, Capinera 2015). In general, herbicides are considered to be far less toxic to animals than insecticides (Capinera 2015). In addition, at proposed application rates for this project, the estimated doses from the exposure scenarios are all less than the reported NOAEL (no-observable adverse effect level) for all herbicides. There are no acute exposure scenarios at application rates described in the Proposed Action that will result in a HQ >1 for a small mammal consuming contaminated insects. The likelihood of a chronic exposure to contaminated insects is remote, given the small acreages treated and the relatively large areas in which bats forage. The bats are not likely to forage exclusively within treated areas over a 90- day period (the chronic exposure) so there does not appear to be a plausible risk from chronic exposure.

**Mechanical, Biological, and Prescribed Burning-** Townsend's big-eared bats are known to utilize a wide variety of habitat types for foraging, including some meadows and pastures that have potential to become heavily infested with noxious and invasive species. If infestations became large enough and contiguous enough, they may be treated using mechanical, biological and prescribed burning weed treatments. Because these treatments cover relatively large areas, reductions in localized prey (insect) populations could occur over the short term. However, insect populations would likely already be reduced in these infested areas due to the lack of native plant biodiversity. Non-native plants can reduce the diversity of insect populations, even where the non-native plants are closely related to the native plants (Science Daily

2015). Therefore, although some short term (one growing season) reductions in insect populations may occur in these localized areas, the restoration of native plant communities will help improve insect populations over the long term. In addition, treatment activities would not be occurring near typical roosting sites for bats and would occur during daylight hours when bats would not be foraging and therefore there will be no direct impacts to Townsend's big-eared bats from these activities.

**Cumulative Impacts:** The biggest threat to Townsend's big-eared bat is the disturbance and destruction of roosting habitats. Within the project area on the Carson Ranger District, the only known roost site for Townsend's big eared bats occurs near Monitor Pass in Alpine County, California. Townsend's big eared bats are also known to occur near the Chemung Mine on the Bridgeport Ranger District. In 2006, bat gates were installed at these sites to protect sensitive bat species from human disturbance. Both mining districts are currently closed to mining and have been inactive for numerous years. Under the proposed action, foraging habitat for Townsend big-eared bats will be improved due to the reduction of noxious weeds resulting in more viable and productive native plant communities. The effects from the proposed action would not incrementally result in negative impacts to Townsend big-eared when considered along with the effects of past, present and reasonably foreseeable actions.

**Determination:** Based on the above analysis, it is my determination the proposed action may impact individual Townsend's big eared bats from temporary reductions in insect populations from prescribed burning and mechanical treatments, but impacts will be minor, short term and will not lead to a trend toward federal listing or a loss of viability.

## **SPOTTED BAT**

**Range, Distribution, and Status:** Although the distributional range of the spotted bat encompasses the project area, very little is known about its actual population distribution. In Nevada, the distribution appears to be patchy with only 12 known records throughout the state none of which are known to be on the Carson Ranger District (Bradley et al. 2006). In California, increased detections of the species indicates spotted bats are more common than previously thought, although still occur in a patchy distribution (Pierson and Rainey 1998). The spotted bat is listed as a Forest Sensitive species in the Northern, Rocky Mountain, and Intermountain Regions of the Forest Service.

**Habitat Requirements and Natural History:** The spotted bat utilizes a variety of habitat types including ponderosa pine, pinyon-juniper forests, desert scrub, and open pasture and hay fields (Leonard and Fenton 1983). They also occur in cliffs located at high elevation alpine and subalpine environments (Luce et al 2007) Spotted bats depend on rock cliff faces for roosting, typically picking cracks and crevices from 0.8 to 2.2. inches in width (Ibid). Spotted bats feed primarily on moths but will also eat a wide variety of other insects. In mountainous habitats, bats forage over meadows, forest edges, and in open woodlands.

**Potential for Occurrence:** Although potential habitat for spotted bats occurs within the project area, there are no known occurrences. The nearest known occurrence was recorded in the city of Reno several decades ago (Luce et al 2007).

**Threats:** The main threats to spotted bat are considered to be habitat alteration, over-collection of spotted bat specimens for research, toxic chemicals (used in wide scale aerial application of pesticides targeted to kill moths and other prey species); disturbance to roosting sites (Luce et al 2007).

## **Environmental Consequences**

### **Direct and Indirect Impacts**

*Manual and Herbicide treatments:* There will be no measurable impacts to spotted bats from the use of manual or herbicide treatments. The primary roosting sites for spotted bats includes areas that are not subject to noxious weed infestations including caves, mines, and rock cliffs. Spotted bats do occasionally roost in bark or in cavities of conifer stands. However, conifer areas are typically not associated with high densities of noxious weeds and therefore any weed treatment near a potential roost site would be rare. Potential foraging habitat for these species such as riparian areas, are prone to some level of noxious weed infestations. However, because both bat species are nocturnal foragers, weed treatment activities, which occur during the day, would not result in any disturbance to foraging bats.

Because of their high rate of food intake, high metabolic rates, and high rate of fat mobilization, all bats can be at risk of bioaccumulation of toxic chemicals from high levels of pesticides found in their prey (insects), particularly when insecticides are used and broadcast and widescale levels (such as aerially) (Luce et al 2007, Capinera 2015). In general, herbicides are considered to be far less toxic to animals than insecticides. In addition, at proposed application rates and using proposed application methods for this project, the estimated doses from the exposure scenarios are all less than the reported NOAEL (no-observable adverse effect level) for all herbicides. There are no acute exposure scenarios at application rates described in the Proposed Action that will result in a HQ >1 for a small mammal consuming contaminated insects. The likelihood of a chronic exposure to contaminated insects is remote, given the small acreages treated and the relatively large areas in which bats forage. The bats are not likely to forage exclusively within treated areas over a 90- day period (the chronic exposure) so there does not appear to be a plausible risk from chronic exposure.

*Mechanical, Biological, and Prescribed Burning-* Spotted bats are known to utilize a wide variety of habitat types for foraging, including some meadows and pastures that have potential to become heavily infested with noxious and invasive species. If infestations became large enough and contiguous enough, they may be treated using mechanical, biological and prescribed burning weed treatments. Because these treatments cover relatively large areas, reductions in localized prey (insect) populations could occur over the short term. However, insect populations would likely already be reduced in these infested areas due to the lack of native plant biodiversity. Non-native plants can reduce the diversity of insect populations, even where the non-native plants are closely related to the native plants (Science Daily 2015). Therefore, although some short term (one growing season) reductions in insect populations may occur in these localized areas, the restoration of native plant communities will help improve insect populations over the long term. In addition, treatment activities would not be occurring near typical roosting sites for bats and would occur during daylight hours when spotted bats would not be foraging and therefore there will be no direct impacts from these activities.

**Cumulative Impacts:** Alteration to important foraging habitat is considered to be one of the largest threats to spotted bats. In addition, the wide scale use of pesticides in some parts of the country is believed to have resulted in some local reductions in spotted bat populations (Pierson and Rainey 1998). Occurrences of spotted bats within the project area are unknown. Under the proposed action, foraging habitat for spotted bats will be improved due to the reduction of noxious weeds resulting in more viable and productive native plant communities. In addition, under the proposed action, the use of herbicides

will have not have any measureable impacts on spotted bats or their prey (insects). The effects from the proposed action would not incrementally result in negative impacts to Townsend big-eared or spotted bats when considered along with the effects of past, present and reasonably foreseeable actions.

**Determination:** Based on the above analysis it is my determination the proposed action may impact individual spotted bats from temporary reductions in insect populations from mechanical and prescribed burning activities, but impacts will be minor, short term and will not lead to a trend toward federal listing or a loss of viability.

## **BIGHORN SHEEP**

**Range, Distribution, and Status:** Three sub-species of bighorn sheep are known to occur in northern and eastern Nevada as well as parts of California: Rocky Mountain (*Ovis canadensis canadensis*), desert (*Ovis canadensis nelson*); and Sierra Nevada bighorn sheep (*Ovis canadensis sierra*). The Sierra Nevada bighorn sheep population was listed as federally endangered in 2008. The other two subspecies of bighorn sheep were listed as Forest Service Sensitive in 2009, based on small population sizes, limited distribution and a decrease from historical population numbers. The nearest occupied herd unit to the analysis area is the East Walker River herd which occurs in Nevada. It has been estimated that desert bighorn sheep were once the most abundant and widely distributed large ungulate in the state of Nevada. Using historical accounts and archeological evidence, the Nevada Department of Wildlife (NDOW) estimated populations at around 30,000 sheep in 1860. By 2001 populations had declined to approximately 6,500 desert bighorn occurring over 74 Nevada mountain ranges (NDOW 2001). Reasons for the decline include European settlement and the subsequent introduction of diseases, as well as destruction and alteration of bighorn sheep habitat (Ibid). In 2010, the desert bighorn population estimate for Nevada was 7,600 (NDOW 2011).

**Habitat Requirements and Natural History:**—Bighorn sheep live in a variety of habitats including sagebrush habitat, pinyon-juniper woodlands, and mountain sagebrush with a grassy understory. Grasses provide a larger portion of their diet than shrubs and forbs (McQuivey 1978). Additional key elements to bighorn habitat are good visibility and steep escape cover that provide security from predators (Coates and Schemnitz 1994). In summer months, bighorn are often associated with water sources, but are able to range further in other seasons (McQuivey 1978). In the winter bighorn sheep typically move from the higher elevations (between 6,000 to 10,000 feet) into lower elevation sites between 2,500 to 5,800 feet. Mating season varies between July and January with lambing usually occurring sometime in May. Specific ranges for bighorn sheep are not known within the project area. Using mapped sagebrush and pinyon juniper woodlands as a proxy for available habitat, there is an assumed 228,379 acres of potential bighorn sheep habitat in the project area. Of this area, approximately 100 acres or 0.04% of the habitat is infested with noxious weeds.

**Potential for Occurrence:** Maps displaying occupied bighorn sheep habitat with Forest Service and Bureau of Land Management domestic sheep allotments were developed in cooperation with the Western Association of Fish and Wildlife Agencies (WAFWA) Wild Sheep Working Group. According to the maps created for California and Nevada, there is no occupied bighorn sheep habitat within the project area. As mentioned above, desert bighorn sheep are known to occupy a relatively small area on the Bridgeport Ranger District primarily within the East Walker River watershed in the Sweetwater Mountain range (in Nevada). Exact population numbers are not known but approximately 60 sheep were observed

in this area during annual surveys conducted by Nevada Department of Wildlife (NDOW) during 2016. According to NDOW, herds in this area appear to be doing well despite the small geographic area they occupy (NDOW 2017). On the Carson Ranger District, bighorn sheep are known to occur north and east of Reno on adjacent non-Forest Service lands (NDOW 2017). Given the relative proximity of NFS lands to where bighorn are known to occur, it is assumed that at least some individuals from herds that occur on adjacent lands occasionally traverse through and forage within the project area.

**Threats:** The greatest threats to bighorn sheep include habitat degradation, human disturbance, and disease transmission from domestic sheep or goats. Disease transmission from domestic sheep can kill large numbers of bighorn sheep with devastating consequences, particularly for smaller, isolated herds (Martin et al 1996).

## **Environmental Consequences**

### **Direct and Indirect Impacts**

*Manual and Herbicide Treatments:* Within bighorn sheep habitat, weed crews and their equipment could temporarily displace individual sheep while weed treatment efforts were being conducted. However, disturbance would be temporary, lasting only one to two days. Herbicides and surfactants applied as described in the proposed action pose no risk to bighorn sheep. SERA risk assessments indicate that at proposed application rates, the estimated doses from the exposure scenarios are all less than the reported NOAEL (no-observable adverse effect level) for all herbicides. There are no acute or chronic exposure scenarios at application rates described in the proposed action that will result in a Hazard Quotient (HQ) above one for large mammals such as bighorn sheep. Herbicides and surfactants applied as described in the proposed action pose no risk to these species. Because bighorn sheep habitat is highly vulnerable to annual grass invasions, particularly after a wildfire, applications of pre-emergent herbicides will likely be a common technique to treat the infestations. This could potentially include applications of pre-emergent herbicides such as imazapyr, aminopyralid, and sulfometuron methyl using boom sprayers from trucks and or UTVs which can be less selective in targeted species than direct application techniques. Shrubs and forbs are slightly more vulnerable to imazapyr, and sulfometuron methyl than aminopyralid. To minimize potential injury to sagebrush, those chemicals would be used primarily in monoculture infestations where few shrubs and other forbs are present.

There will be no long term negative impacts to bighorn sheep habitat under the proposed action from manual or herbicide treatments. As mentioned above, herbicides will be carefully selected when conducting treatments within bighorn sheep habitat to reduce the potential for inadvertent damage or mortality to sagebrush and other native plant communities. Areas that are treated manually will likely revegetate within the same growing season or by the following year. Over the long term, control and eradication of invasive species such as cheatgrass in bighorn sheep habitat will help maintain quality habitat for this species.

### *Biological Controls:*

Targeted grazing: To reduce the threat of disease transmission, targeted grazing using domestic sheep would not be used to treat weeds in areas where interactions could occur with wild sheep. Targeted grazing from other livestock may result in some disturbance and temporary displacement of individual bighorn sheep. However, for the purposes of weed control, livestock are expected to sweep through the

treatment area, rather than congregate in one place for an extended period, which would limit potential long term, permanent impacts such as disturbance or grazing competition. Overtime, any short term impacts to bighorn sheep would be offset by overall improved habitat conditions for the species by reducing invasive grass and other noxious weed species.

Insects: It is unlikely that insects would be used in bighorn sheep habitat for biological control purposes. Currently there is no known insect or pathogen that is effective in reducing cheatgrass infestations. Although other noxious weeds such as thistles can occasionally occur in some portions of bighorn sheep habitat, they typically occur in such small numbers that the use of insects would not be effective. If biological controls are determined to be the appropriate treatment method, under the Proposed Action, only biological control agents that are permitted for release by the USDA Animal Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) will be used. Before being permitted by APHIS and CDFA, these insects must undergo considerable testing and meet other strict criteria prior to their release to ensure they will not pose a threat to non-target species (CDFA 2018). By utilizing only federally and state approved insects to control noxious weeds, the risk for inadvertent harm to native vegetation in the project area is minimal.

*Mechanical and Prescribed Burning-* Mechanical and prescribed burn treatment methods and conditions would be identical as to those described in the sage grouse and pygmy rabbit sections above. Bighorn sheep could be displaced during burning and or mowing operations due to disturbance from crews and equipment. Because prescribed burning would only occur in small increments (20 acres or less), bighorn sheep would be able to easily escape the treatment area without incurring any impacts from smoke or heat associated with the fire. Depending on the level of ground disturbance and vegetative plant response to burning and or mowing, bighorn sheep may not return to the area until native plant communities recover (one to five years). Burning in bighorn sheep habitat would occur rarely and under highly controlled circumstances. Short term impacts to bighorn sheep habitat would result from prescribed burning treatments while native plant communities recover. Recovery period could take potentially up to five years for reestablishment of native grasses and re-sprouting of sagebrush. Over the long term, however, habitat conditions would be improved by removing non-native grasses and allowing for native plants to recover.

**Cumulative Impacts:** The biggest threat to bighorn sheep is disease transmission from domestic sheep. Loss of habitat from wildfires and invasion of non-native annual grasses also have become an increasing concern in bighorn sheep habitat. Within the last decade, wildfire has burned thousands of acres of sagebrush and pinyon juniper habitat within and adjacent to the project area. Including the Spring Peak fire in 2013 which burned nearly 12,000 acres of primarily sagebrush habitat. Cheatgrass and other invasive species are present in some of these burned areas; however, post fire restoration efforts, such as seeding and active weed management have helped with native plant restoration. In 2015, a collaboration of agencies and volunteers planted several thousand sagebrush seedlings in the Spring Peak burn area to help restore sagebrush habitats. To reduce the threat of future high intensity fires, the BLM, the Forest Service and other local agencies have completed or are in the process of completing multiple fuels reduction projects and habitat restoration projects in or near important habitat sage grouse which could potentially benefit bighorn sheep as well (Bi-State Plan 2012). Under the proposed action, treatment of invasive species such as cheatgrass will also help reduce the fuel loading in sagebrush habitat as well as reduce the threat of increased infestations following a wildfire. The effects from the proposed action

would not incrementally result in negative impacts to bighorn sheep when considered along with the effects of past, present and reasonably foreseeable actions.

**Determination:** Based on the above analysis, it is my determination the proposed action **may impact** individual bighorn sheep but will not lead to a trend toward federal listing or a loss of viability.

### **SIERRA NEVADA RED FOX**

**Range, Distribution, and Status:** The Sierra Nevada red fox (SNRF) is a subspecies of red fox (*Vulpes vulpes*) that historically ranged from the southern Cascade Mountains south along the Sierra crest to Tulare County (CDFG 2004). The Sierra Nevada Distinct Population Segment (DPS) of the SNRF is considered a candidate species for listing under the Endangered Species Act (USDI 2015). The SNRF was also listed as threatened by the State of California in 1980 (CDFG 2004) and is a Forest Service Region 4 and 5 Sensitive Species. The SNRF was rediscovered in 2010 in the Sierra Nevada, on the Bridgeport Ranger District (Perrine 2010). Prior to 2010, this subspecies was thought to consist of less than two dozen individuals, restricted to the Lassen Peak region, and the distribution outside of this region was unknown (Perrine et al. 2010). Because of the very few reports of this animal, it is likely they exist in very small numbers, they avoid humans or the public is unaware of their rarity and does not report sightings.

**Habitat Requirements and Life History:** Little is known about the ecology of the SNRF, due to the lack of comprehensive studies, and because the results of existing studies have not appeared in peer reviewed literature (Perrine et al. 2010). Based on historical records, SNRF occur from approximately 3,900 to 11,800 feet in elevation (Grinnell 1937, Schempf and White 1977). In Lassen National Forest, habitat for the SNRF included subalpine conifer, barren and shrub habitats at high elevations in summer (Perrine et al. 2010). Perrine (2010) found that in winter, they moved to elevations approximately 1,600 feet below summer habitat. However, few foxes in this study were collared and some of the population was habituated and food conditioned, making correlations to the project area population difficult. Most of the detections of SNRF recently found on the Bridgeport Ranger District were found at very high elevations (above 10,000 feet).

Little is also known about the dens of SNRF (Perrine et al. 2010), but it is thought that they den in natural cavities in talus slopes (Grinnell 1937). Breeding is thought to occur in mid-February with pups being born in April (Perrine et al. 2010). Primary food sources include small mammals such as pocket gophers and birds such as hairy woodpeckers (Perrine 2005).

**Potential for Occurrence in the Analysis Area:** The Sierra Nevada red fox is known to occur on the Bridgeport Ranger District near the top of Sonora Pass. Sierra Nevada red foxes have also been recently detected on the Carson Ranger District near the Ebbett's Pass area. Based on the distribution of camera detections, tracks and scat, it is possible there are several family groups. Currently the Sierra Nevada DPS is believed to consist of 29 adults (USDI 2015).

**Threats:** Potential threats and/or stressors to the SNRF include habitat loss from development and climate change, loss of prey base from grazing, competition from coyotes and introduced red fox, predation, and disturbance from recreation (Perrine et al. 2010). California Department of Fish and Game (2007) noted that development of ski areas, snowmobile parks and trail in alpine areas where SNRF occur can also be a threat. The largest threat to the species may be the lack of data about its ecology (Perrine 2010).

### **Environmental Consequences:**

Under the proposed action, impacts to SNRF from weed treatment methods would be minimal, have no long term negative impacts, and eventually be beneficial.

Sierra Nevada red fox occur in sparsely vegetated plant communities located at high elevation areas (between 7,000 and 10,000 feet) that are typically not susceptible to noxious and invasive weed infestations. These environments tend to have low vegetation densities due to the granitic, rocky soil types, short growing season and other ecological factors. Noxious and invasive weeds rarely occur in these environments and then only occur typically as isolated individual plants rather than large homogenous infestations. Currently no known or mapped locations of weeds above 8,000 feet occur in the Carson or the Bridgeport area and only one mapped location occurs between 7,000 and 8,000 feet (curly dock).

### **Direct and Indirect Impacts**

*Manual and Herbicide Treatments:* Direct effects to SNRF from manual and herbicide treatment methods include disturbance to foxes from human activity. Sierra Nevada red foxes may flush from a treatment site and avoid the area while activities are occurring. However, treatments would likely be accomplished in one day and usually by no more than two people and therefore would not result in any long term effects to SNRF.

Under the proposed action there will be no measurable effect to SNRF from the use of herbicides to treat noxious and invasive species. As mentioned above the potential for future populations of noxious and invasive weeds to occur in SNRF habitat is very low due to the high elevation and rocky soil types associated with the species. Any noxious weeds that may potentially occur in this area would likely be single, isolated plants that could most likely effectively be treated with hand pulling and bagging techniques. Herbicides would only be used in the rare instances when hand pulling was determined to not be effective and the threat of infestation of native plant communities was eminent. To minimize the potential for drift in SNRF occupied habitat, weeds would be individually treated using the wicking and wiping method or the dipping and clipping technique. Both of these methods result in herbicide being applied to the main stem of the weed and greatly reduces the amount of herbicide needed to treat noxious weeds as well as the potential for inadvertent drift to non-target species. These methods also reduce the potential for surface runoff and/or leaching of herbicides into the soil because herbicide applications would only be applied to the main stem of the plant and not to the soil surface. SERA risk assessments indicate that at proposed application rates, the estimated doses from the exposure scenarios are all less than the reported NOAEL (no-observable adverse effect level) for all herbicides. There are no acute or chronic exposure scenarios at application rates described in the proposed action that will result in a Hazard Quotient (HQ) above one for large canids such as SNRF. HQs for a canid consuming small mammals contaminated by direct spray, is below one for all herbicides in the Proposed Action.

Manual and herbicide treatments will result in some minor ground disturbance but will have no long term effect on soils and other native vegetation important to SNRF.

*Mechanical, Biological Controls, and Prescribed burning:* There will be no effect to SNRF from mechanical, biological controls or prescribed burning treatment methods because these methods will not be used within occupied habitat for SNRF. Mechanical, biological, and prescribed burning methods are

appropriate when treating large monocultures of invasive or noxious weed species which do not occur in the high elevation habitats associated with SNRF.

**Cumulative Impacts:** Current and foreseeable actions that potentially impact SNRF include ongoing activities such as public snowmobiling, recreational use of hiking trails, and military training activities at the Marine Mountain Warfare training facility. It is not known how these disturbances are currently impacting SNRF. However, given the minimal need for weed treatments to ever occur in SNRF habitat, the proposed project will not result in any measurable additional impacts from disturbance to the species or its habitat. Some minor, short term disturbance to foxes may occur during treatment activities but over the long term, maintaining native plant communities will benefit the Sierra Nevada red fox. The effects from the proposed action would not incrementally result in negative impacts to the Sierra Nevada red fox when considered along with the effects of past, present and reasonably foreseeable actions.

**Determination:** Based on the above analysis, it is my determination the proposed action **may impact** individual Sierra Nevada red fox but will not lead to a trend toward federal listing or a loss of viability.

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